TABLE OF CONTENTS

Vertical MC

Y travel or Rotary table dia. (mm)		a	b		c	d				e			
		Tapping Center	VMC		Productivity VMC	Die & Mold VMC				5axis VMC			
		DT series	DNM series	Mynx series	VC series	VM series	DVM series	NX series	FM *linear* series	DNM series	NX series	VC	FM *linear* series
													
Y travel (mm)	~ 450	DT 400 DT 360D DT 400L	DNM 400 II		VC 430			NX 4500 II	FM 400 *linear*				
	~550		DNM 500 II	Mynx 5400	VC 510	VM 5400 VM 560	DVM 500 II	NX 5500 II					
	~670		DNM 650 II	Mynx 6500		VM 6500	DVM650 II	NX 6500 II					
	~750		DNM 750	Mynx 7500		VM 750							
	~850												
	~960		DNM 900			VM 960							
	~1260					VM 1260							
Rotary table dia. (mm)	200									DNM 200/5AX			FM 200/5AX *linear*
	350									DNM 350/5AX			FM 350/5AX *linear*
	630											VC 630/5AX	

[매출실적] 전체_본사출하기준

Only reference

량			년도					
(열 1)대지	시리즈	세부기종(소)	2009	2010	2011	2012	2013	총합계
미주	VMC-5AX	DNM350/5AX				1	4	5
		VC630/5AX		3	2	1	3	9
	VMC-5AX 요약			3	2	2	7	14
미주 요약				3	2	2	7	14
유럽	VMC-5AX	DNM350/5AX			3	26	12	41
		NX500/5AX			1			1
		VC630/5AX	4	12	15	28	24	83
		VMD600/5AX	1					1
	VMC-5AX 요약		5	12	19	54	36	126
유럽 요약			5	12	19	54	36	126
인도/기타	VMC-5AX	DNM350/5AX					1	1
		VC630/5AX			1	1		2
	VMC-5AX 요약				1	1	1	3
인도/기타 요약					1	1	1	3
중국	VMC-5AX	VC630/5AX				1	2	3
	VMC-5AX 요약					1	2	3
중국 요약						1	2	3
한국	VMC-5AX	DNM350/5AX				8	16	24
		FM200/5AX				1		1
		VC630/5AX	1	13	21	29	38	102
		VMD600/5AX	4	2	1			7
	VMC-5AX 요약		5	15	22	38	54	134
한국 요약			5	15	22	38	54	134
요약			10	30	44	96	100	280

Concept…

Doosan 5axis VMC

Compact class
C-frame
Direct coupled spindle

DNM 5AX series

DNM 200/5AX
DNM 350/5AX

* Direct coupled spindle from 2014 mass production plan

High precision
Column moving frame
Built-in spindle

VC 5AX series

VC 630/5AX

Ultra precision w/ Linear motor
Gantry type frame
Built-in spindle
Mineral cast iron

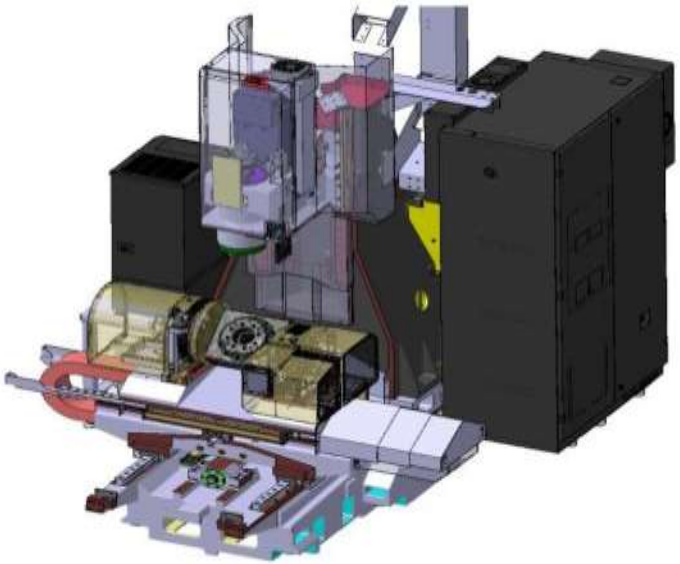
FM 5AX series

FM 200/5AX *linear*
FM 350/5AX *linear*

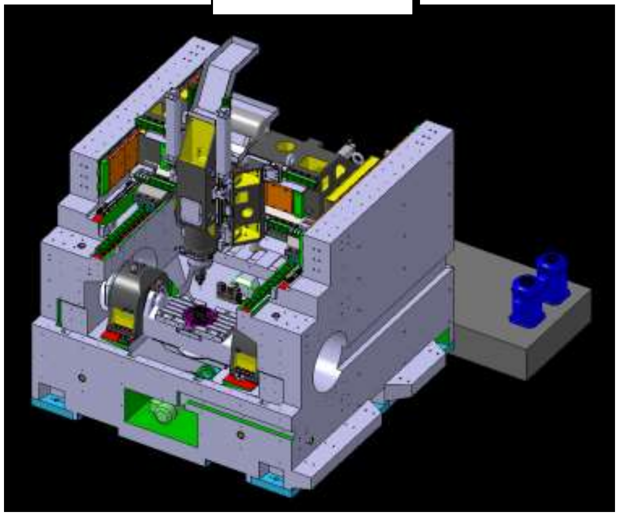
Structure_Doosan's 5axis VMC

Back-up

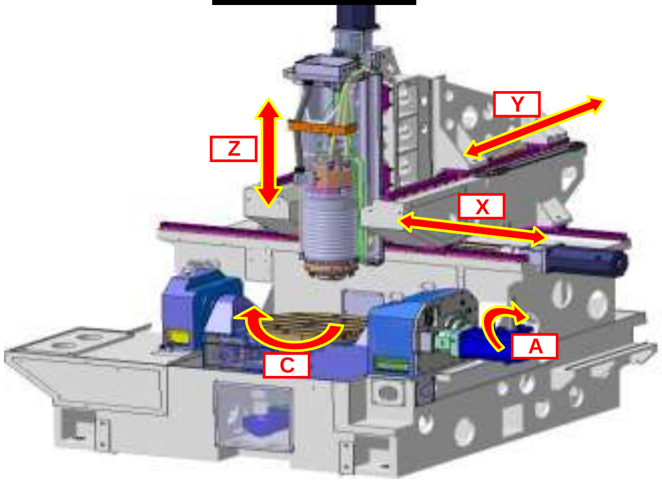
DNM200/5AX
DNM350/5AX



FM/5AX



VC630/5AX



DNM 5AXIS series

Function

Size

Rotary table dia. (mm)	Tool taper	Non simultaneous 5AX((4+1axis))	Simultaneous 5AX	
		F0iMD	F31i5	iTNC530
200	HSK E40			FM 200/5AX *linear*
200	#40	**DNM 200/5AX**	New	
350	#40	**DNM 350/5AX**		
350	HSK E40			FM 350/5AX *linear*
500	#40			
630	#40		VC 630/5AX	

DNM 5AX series _ DNM 200/5AX New

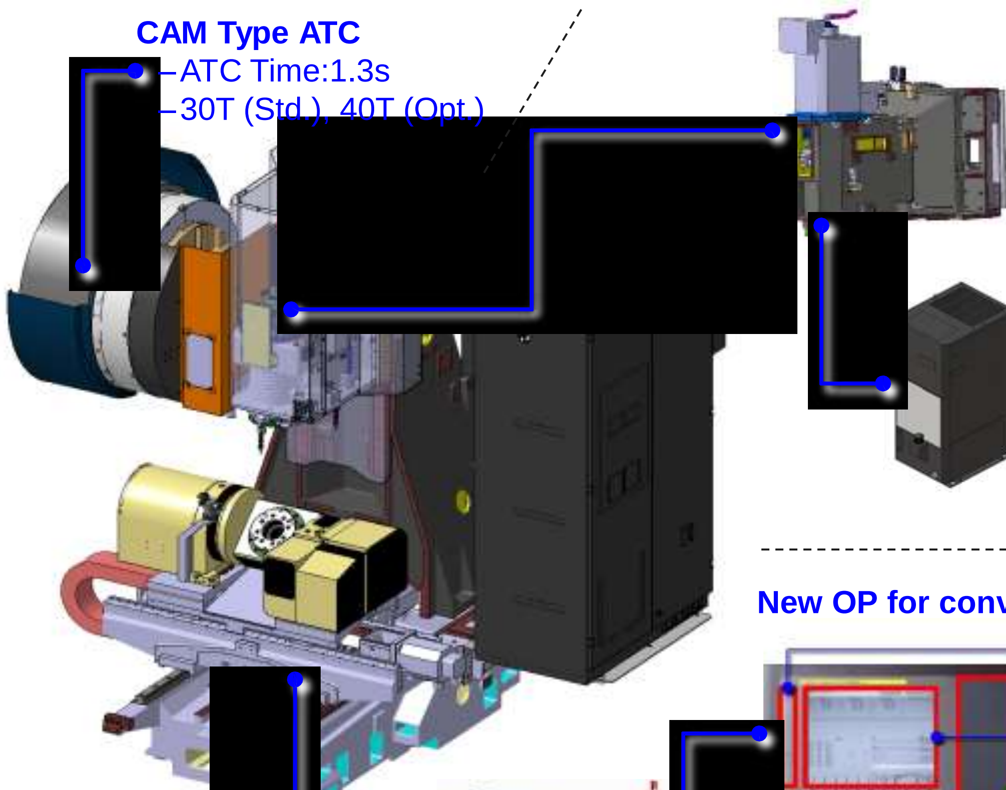
New addition of DNM 5AX series with trunnion type rotary table for customers who require entry level 5(4+1) axis machining as a practical class

• DNM 400

+

• Trunnion type Rotary table: dia. 200mm

CAM Type ATC
- ATC Time:1.3s
- 30T (Std.), 40T (Opt.)



12kr/min w/ Direct coupled spindle & Dual contact spindle as standard

Oil cooler for spindle & ball screw nut as standard

Roller type LM guideway for X/Y/Z axis

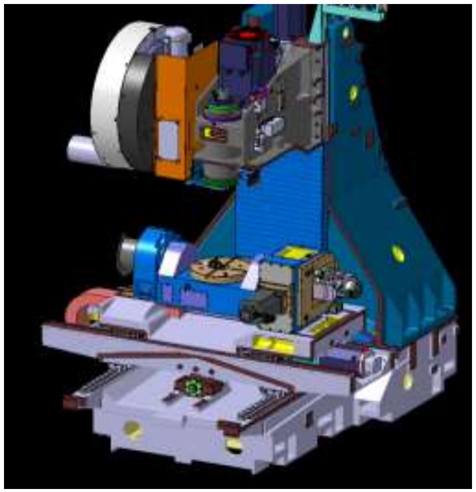
New OP for convenience

- USB & PCMCIA Card ports as std.
- 10.4" Color LCD & EZ-i as std.
- Optional buttons such as fixture clamp/unclamp button, counter, timer or etc.
- QWERTY keyboard
- New designed Operation Panel w/ Hot keys for easy operation

DNM350/5AX – OVER VIEW

5ax VMC for Various Application

- High performance 5-Axis VMC
  for entry level 5-axis machining



MAJOR SPECIFICATION

- STROKE : 400/670/550 mm
- TABLE SIZE : Φ350 mm, 250kgf
- SPINDLE : 12,000(20,000) rpm, BT40
- SPINDLE POWER : 11/15kW
- RAPID TRAVERSE (X/Y/Z) : 36/36/30 m/min
- RAPID TRAVERSE (A/C) : 20/30 m/min
- TOOL STORAGE : 30T(40T)
- ATC TIME : 1.3 sec
- NC : FANUC / HEIDENHAIN

APPLICATION

- AUTOMOTIVE
- AEROSPACE, MEDICAL

TYPICAL WORKPIECE

- Impeller
- Manifold
- Precision mechanics

MAIN FEATURES

- ROLLER LM GUIDEWAY
- BALL SCREW COOLING
- OIL COOLER & DUAL CONTACT SPINDLE STD.
- DHC : Doosan Heat Control

COMPATITORS

- YCM(TAIWAN), MORI, OKK, MAZAK

STATUS / SCHDULE

- Proto : JAN. 2011
- MASS PRODUCTION : AUG. 2011~

DNM350/5AX – Major units & sales point (1/5)

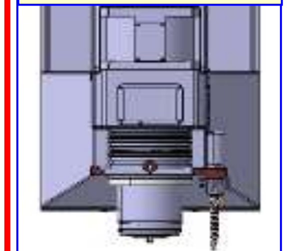
TS27R (STD.)

- Automatic tool length measure.
- Axis direction thermal displacement compensation

CAM Type ATC

- ATC Time:1.3s
- 30tool
- 40tool (opt.)

12,000r/min



- Thermal symmetry Spindle head body structure.
- Thermal displacement compensation equipment (opt.)

Belt ➔ direct

Dual contact system (STD.)

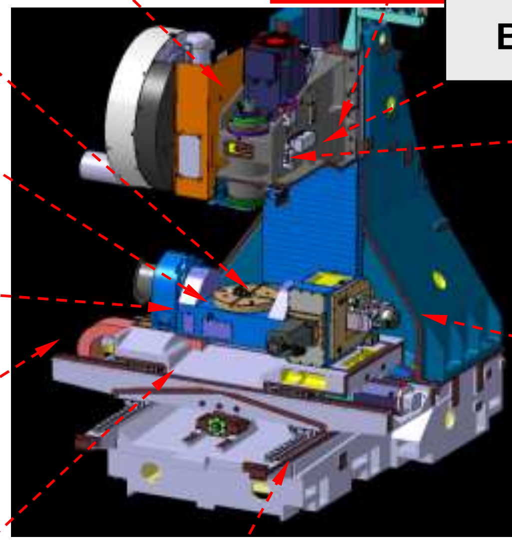
- Machining precision through minimized tool vibration

Linear scale (OPT.)

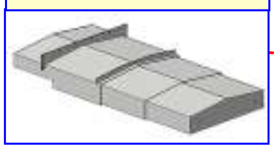
- Direct Feed Back

Air Blow (STD.)

- Easy MQL Piping
- Better working circumstance



Slide Cover



- Minimize machining precision influence.

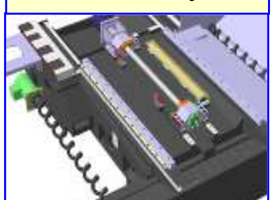
Worm wheel

- High Torque
- Self locking structure

Oil Cooler

- Spindle head cooling system
- Minimize spindle head thermal displacement.

Screw Conveyor

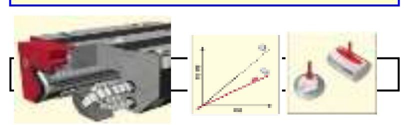


- Internal Screw conveyors for easy chip disposal

Coolant Chiller(OPT.)

- Restrain thermal deformation by coolant temp. control.

Roller LM Guide



- Higher load capacity
- Higher damping coefficient

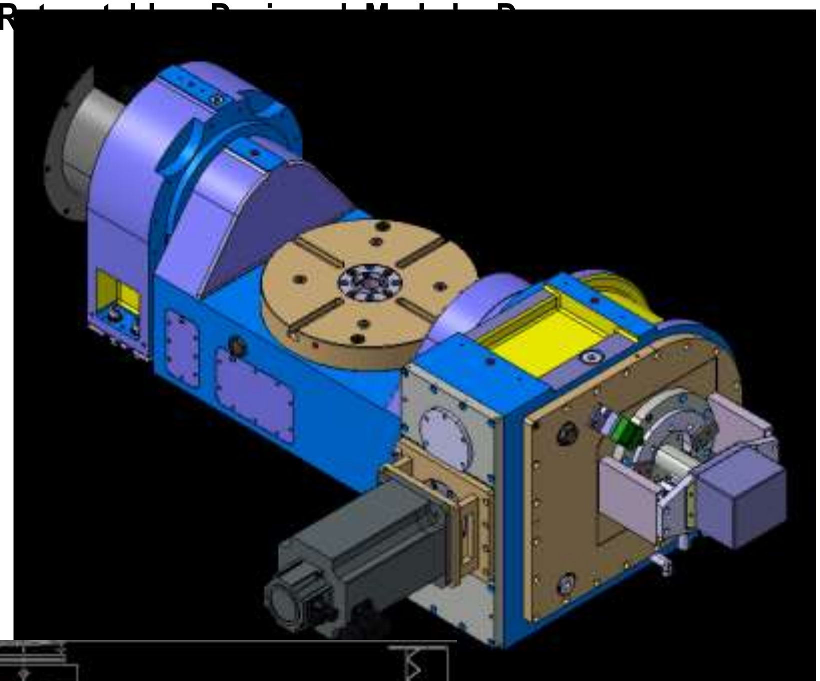
High rigid structure

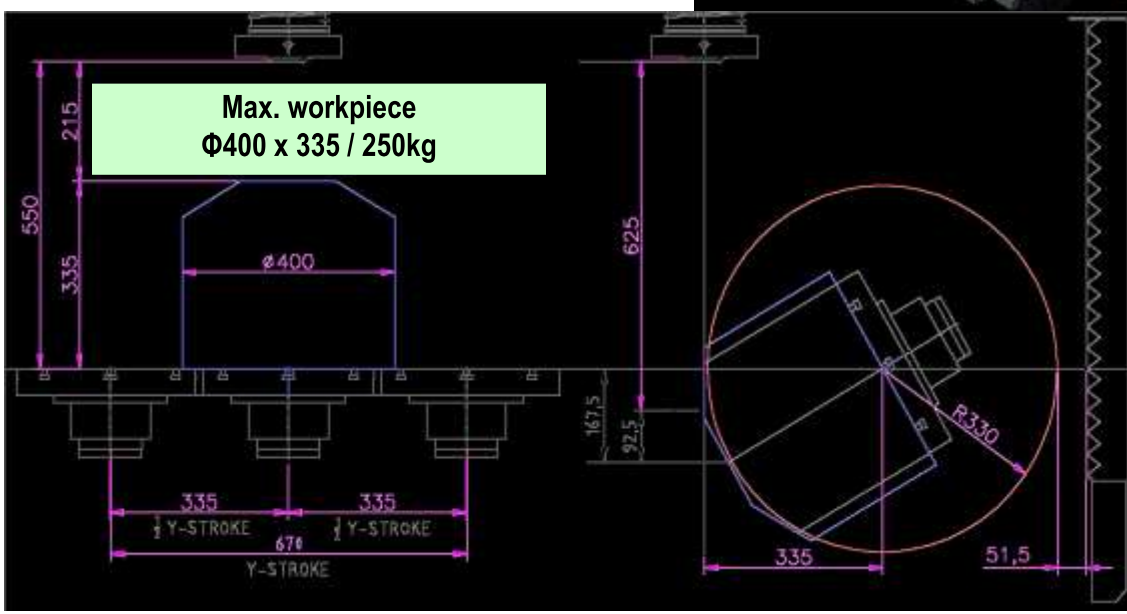
- Rigid C-frame structure with ARCH-shape column

DNM350/5AX – Major units & sales point (2/5)

Biggest workpiece in it's class, High Stiffness & High-precision R

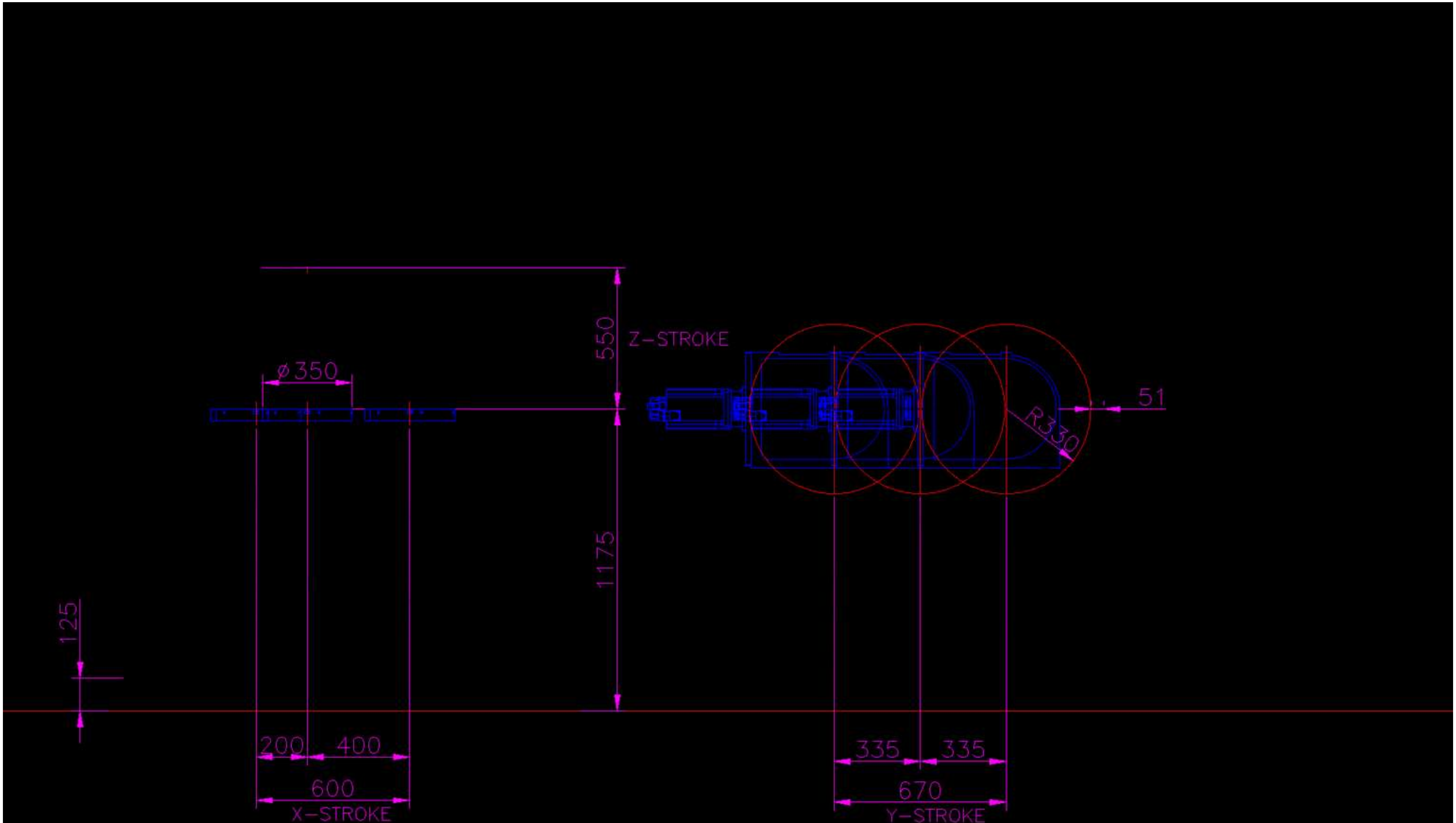
Items		Unit	DNM350/5AX
TABLE	Size (Dia.)	㎜	Φ350
	Max. Work size	㎜	Φ400x335
	Max. Work wehght	kgf	250
TRAVEL	Rotating (C-Axis)	deg	360
	Tilting (A-Axis)		+30~-120
RAPID	Rotating (C-Axis)	rpm	30
	Tilting (A-Axis)		20





DNM350/5AX – Major units & sales point (3/5)

Biggest work area in it's class

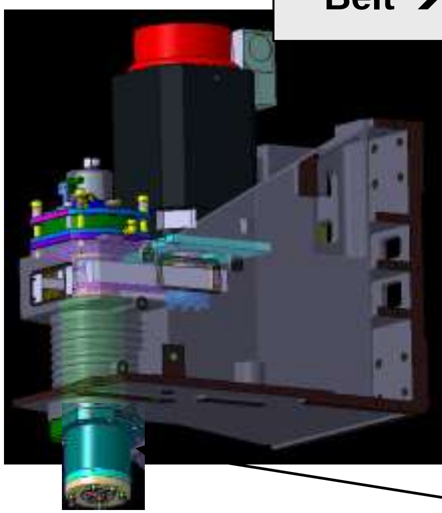


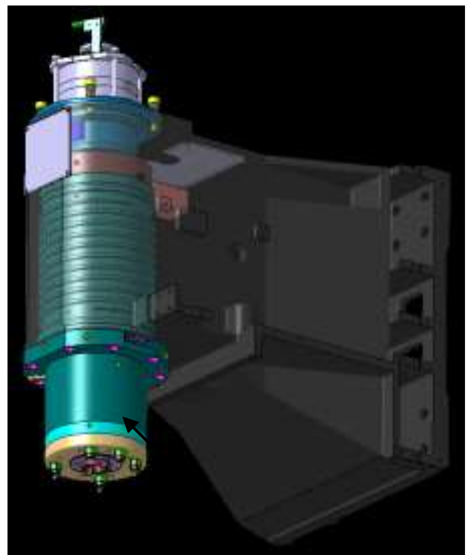
DNM350/5AX – Major units & sales point (4/5)

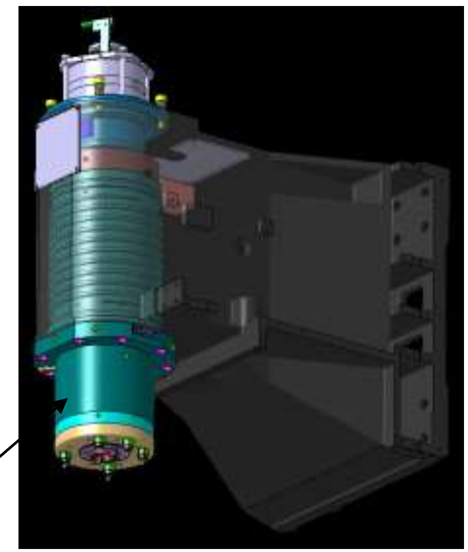
Various spindle

	Fanuc		Haidenhein
Type	Belt	Built-in	Built-in
Rpm	12k	12k / 20k	12k / 20k
Motor	α12/12000i	αB112S/20000i	SMI 170-250-4 (Same VC630) <= DNM-HS Cartridge Modify
	Applied for 4+1 Version	Applied for 5-Axis Version	Applied for 5-Axis Version

Belt ➔ direct





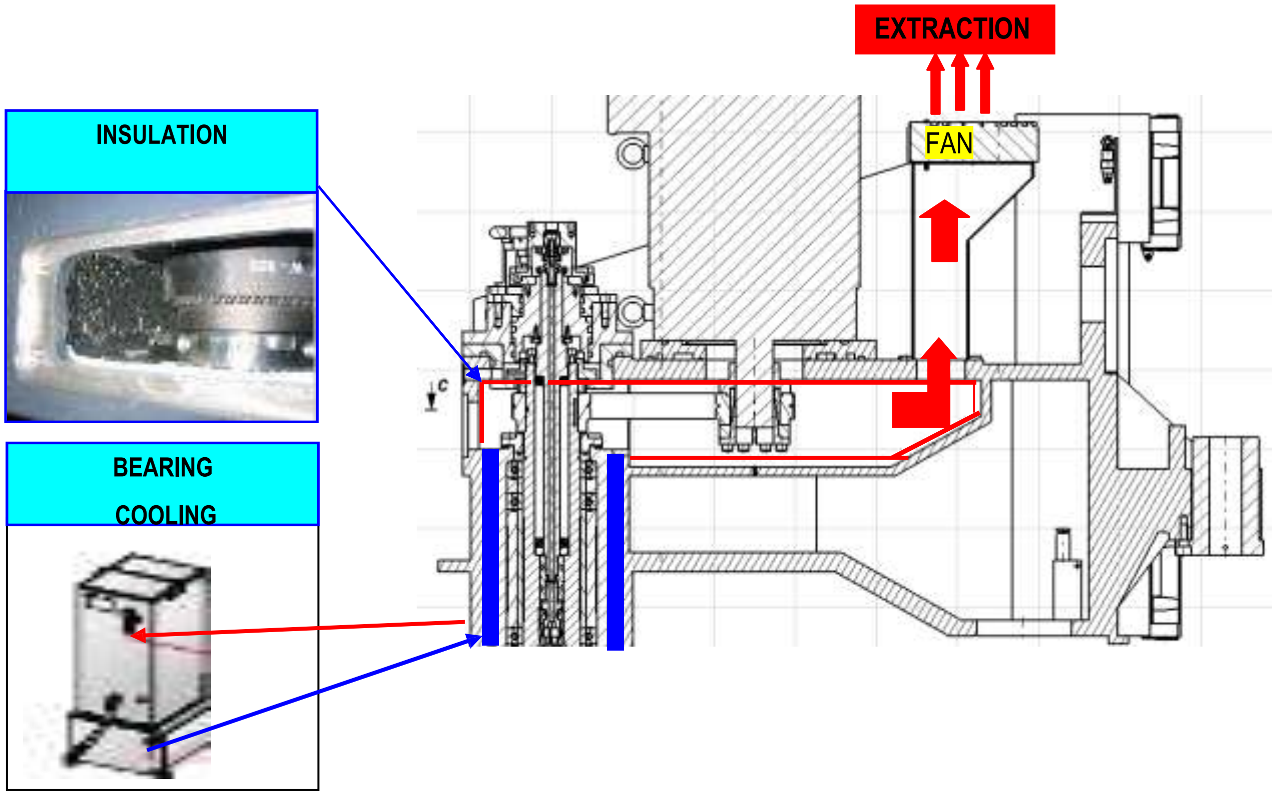


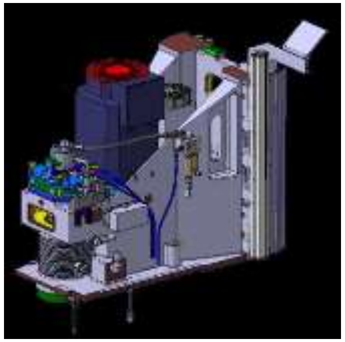
Apply a Long Nose

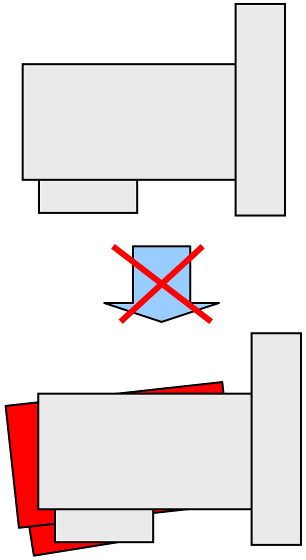
DNM350/5AX – Major units & sales point (5/5)

Design for minimizing thermal growth

- Heat from Bearing : Chilled by Oil circulation.
- Heat from Belt : Insulates body casting from hot air and ventilates using the fan.







DNM350/5AX – Specification

COMPARISON IN SPECIFICATIONS

Specification		Unit	Fanuc_4+1	Fanuc_F31iA5	Heidenhain_TNC530
Travel	X/Y/Z axis	mm	400/655/500	400/655/500	400/655/500
	A/C axis	deg	+30~-120/360	+30~-120/360	+30~-120/360
Rapid Traverse	X/Y/Z axis	m/min	36/36/30	36/36/30	36/36/30
	A/C axis	m/min	20/30	20/30	20/30
Table	Max. workpiece(D x H)	mm	Φ400 x 335	Φ400 x 335	Φ400 x 335
	Load Capacity	kgf	250	250	250
Spindle	Power Transmission		**Belt**	**Built-in(aB112L)**	**built-in**
	Spindle Taper		#40 - BT/CAT/DIN 40	#40 - BT/CAT/DIN 40	#40 - BT/CAT/DIN 40
	Max. Spindle Speed	rpm	12k(a12/12k)	12k(20K)	12k(20K)
	Power	kW	11/15	18.5/22	24/32
	Torque	Nm	106	167	119
ATC	Tool Storage	ea	30(40)	30(40)	30(40)
	Max. Tool Size	mm	300	300	300
	Max. Tool Weight	kgf	8	8	8
	T.T.T	sec	1.3	1.3	1.3
Control	Controller		**Fanuc OiMD**	**Fanuc 31iA**	**Heidenhain iTNC530**
	Servo motor (X,Y,Z)		X/Y/Z=a22	X/Y/Z=a22	X/Y/Z=155D/155F/155F(B)
	Servo motor (A,C)		A/C=a12/a8	A/C=a12/a8	A=QSY122B EcoDyn |C=QSY130E
	Disply screen		10.4"	10.4"	15"

DOOSAN

Concept…

Doosan 5axis VMC

Compact class
C-frame
Direct coupled spindle

DNM 5AX series

DNM 200/5AX
DNM 350/5AX

* Direct coupled spindle from 2014 mass production plan

High precision
Column moving frame
Built-in spindle

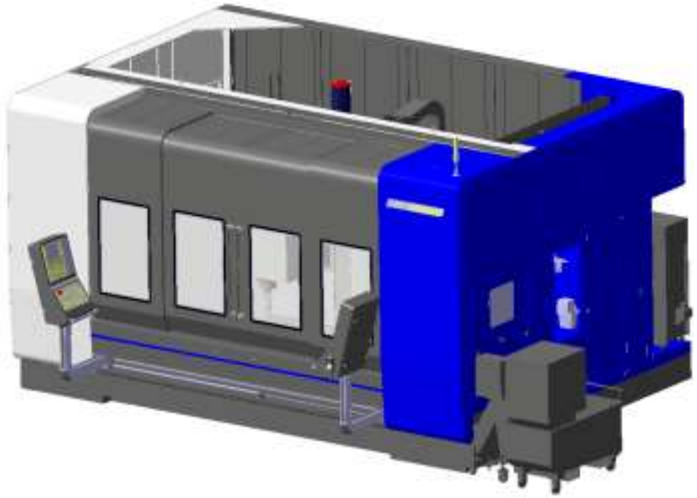
VC 5AX series

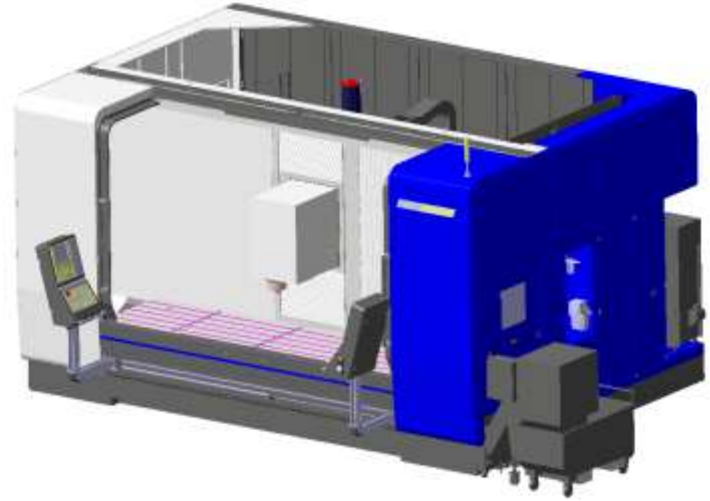
VC 630/5AX
VCF 850 series

Ultra precision w/ Linear motor
Gantry type frame
Built-in spindle
Mineral cast iron

FM 5AX series

FM 200/5AX *linear*
FM 350/5AX *linear*





VCF850L & 5AX

[Back up] Machine Specifications

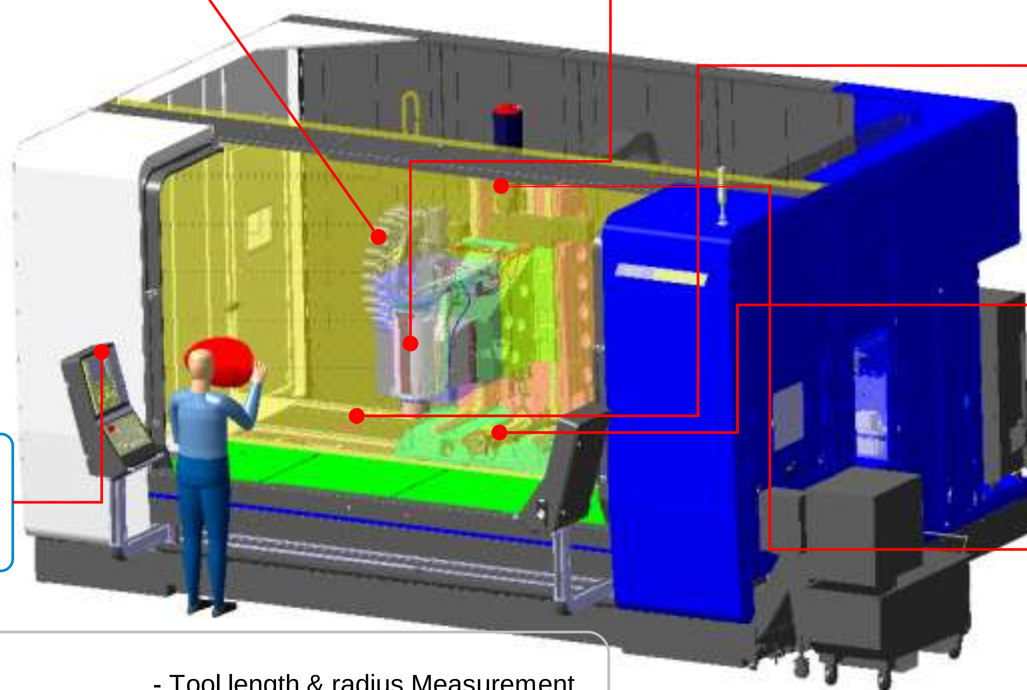
Description		Unit	Doosan		MAZAK		DMG	YCM		HEDELIUS
			VCF850L	VCF850L/5AX	VTC800/30	VTC800/30 SR	DMF 260	TCV3000A	TCV3000A-5AF	T8
Capacity	X-axis travel	mm	3,000	←	3,000	←	2,600	3,000	←	3,200
	Y-axis travel	mm	850	←	820	800	1,100	800	←	800+65
	Z-axis travel	mm	800	←	720	←	900	700	800	850
	B-axis travel	deg	-	±110	-	±110	±100	-	±110	-92~+92
	C-axis travel	deg	[360]	←	[360]	360	360	-	360	360
Table	Table size	mm	3,500 X 870	←	3,500 X 820	←	3,200 x 1,100	3,500 X 800	←	3,800 x 800
	Table loading capacity	kg	3,500	←	2,500	←	4,000	3,000	←	3,500
Spindle	Max. spindle speed	min^{-1}	12k[18k]	12k[18k]	12k	18k	8k[14K,18K]	12k, 150k	←	12k/15k/18k
	Spindle motor	kW	22	←	22	←	24	22	←	26.5/35
Feedrates	Rapid traverse (X,Y,Z)	m/min	40	←	50	←	40	40	←	40/45/45
	Rapid traverse (B)	m/min	-	50	-	50	40	?	33	?
	Rapid traverse (C)	m/min	-	25	25(opt.)	25	16	?	100	?
	Guide way Type	-	Roller LMG	Roller LMG	←	←	←	←	←	←
ATC	Tool storage capacity	tools	30[60]	←	30[48]	←	30[60, 120]	40[80]	←	40[100]
	Max. tool diameter	mm	80	←	80	←	80	76	←	80
	Max. tool diameter without adjacent tools	mm	130	←	130	←	130	125	←	?
	Max. tool length	mm	300	←	350	←	300	300	←	330
	Max. tool weight	kg	8	←	8	←	6	6	←	8
	Tool shank type	-	ISO 40	←	←	←	←	←	←	←
CNC			F0iMD (iTNC530)	iTNC530 (F31iB5)	Mazatrol matrix nexus Mazatrol matrix		iTNC530, S840D	MXP-200 FB(Fanuc base), iTNC530(opt.)		iTNC530, S840D
Machine size	dimensions (length x width x height)	mm	5,390 x 3,930 x 3,131	←	5,250 x 3,573 x 3,152	5,250 x 3,573 x 3,328	6,712 x 4,352 x 3,042	6,990 x 4,352 x 3,400	←	?
	Weight	kg			15,400	16,300	?	2,400	24,700	20,000

[Back up] VCF850L MACHINE CONCEPT/3 Axis (Draft)

ATC
- Std. 30/Drum Type(DNM Modify)
- Opt. 60/Chain type
- T-T-T Time : 1.5sec

SPINDLE
- Taper : BT40 (HSK–A63)
- Speed : 12,000rpm (opt. 18,000rpm)
- Power (Const/ Short) : 18.5kW / 22kW
- 12k – Torque (Max.) : 204Nm (α112LL/15000iB)
- 18k – Torque (Max.) : 118Nm (α112L/20000iB)
- BIG PLUS as standard (two–face contact)

X : 3,000
Y : 850
Z : 800



X-AXIS
- Rapid traverse : 40mpm
- Roller type LMG (3 raws)
- Ball screw nut cooling & support bearing cooling (std.)
- Linear scale (Option)

Y-AXIS
- Rapid traverse : 40mpm
- Roller type LMG
- Ball screw nut cooling & support bearing cooling (std.)
- Linear scale (Option)

Z-AXIS
- Rapid traverse : 40mpm
- Roller type LMG
- Ball screw nut cooling & support bearing cooling (std.)
- Linear scale (Option)

Access convenience structure
- 180˚ Swiveling Type OP Panel
- Easy operation & vision

Option
- Auto door
- Linear scale feed back system(X, Y, Z axis)
- Through the spindle coolant system
- Oil skimmer
- Oil mist collector
- Tool length & radius Measurement
- Test bar
- Chip conveyor & bucket
- MQL

DOOSAN

[Back up] VCF850L MACHINE CONCEPT/5 Axis (Draft)

ATC
- Std. 30/Drum Type(DNM Modify)
- Opt. 60/Chain type
- T-T-T Time : 1.5sec

SPINDLE
- Taper : BT40 (HSK-A63)
- Speed : 12,000rpm (opt. 18,000rpm)
- Power (Const/ Short) : 18.5kW / 22kW
- 12k – Torque (Max.) : 204Nm (α112LL/15000iB)
- 18k – Torque (Max.) : 118Nm (α112L/20000iB)
- BIG PLUS as standard (two-face contact)

B-AXIS
- Rapid / Stroke : 50rpm / ±110degree
- Drive Torque / Hyd. Clamp Torque
  : 1,000Nm / 2,000Nm(@50bar)

X : 3,000

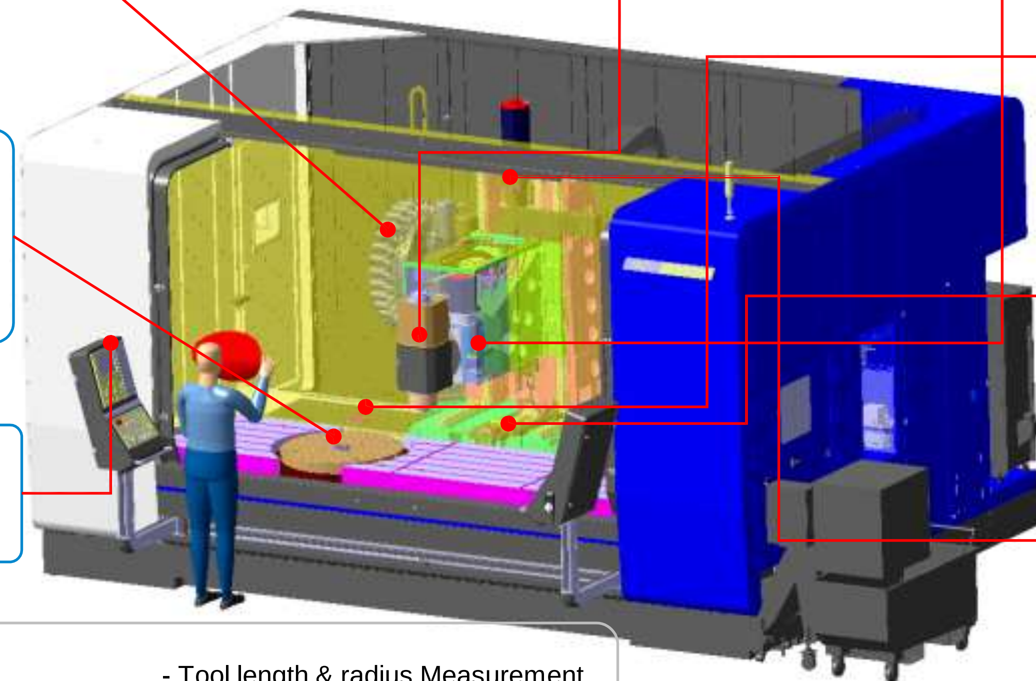
Y : 850

Z : 800

Indexing Table(C axis)
- Size / Rapid : Φ800mm / 25rpm
- Max. Allowable Load : 1,200kg
- Max. Workpeice
  : Φ1,050 x h 900

X-AXIS
- Rapid traverse : 40mpm
- Roller type LMG (3 raws)
- Ball screw nut cooling
  & support bearing cooling (std.)
- Linear scale (Option)

Y-AXIS
- Rapid traverse : 40mpm
- Roller type LMG
- Ball screw nut cooling
  & support bearing cooling (std.)
- Linear scale (Option)

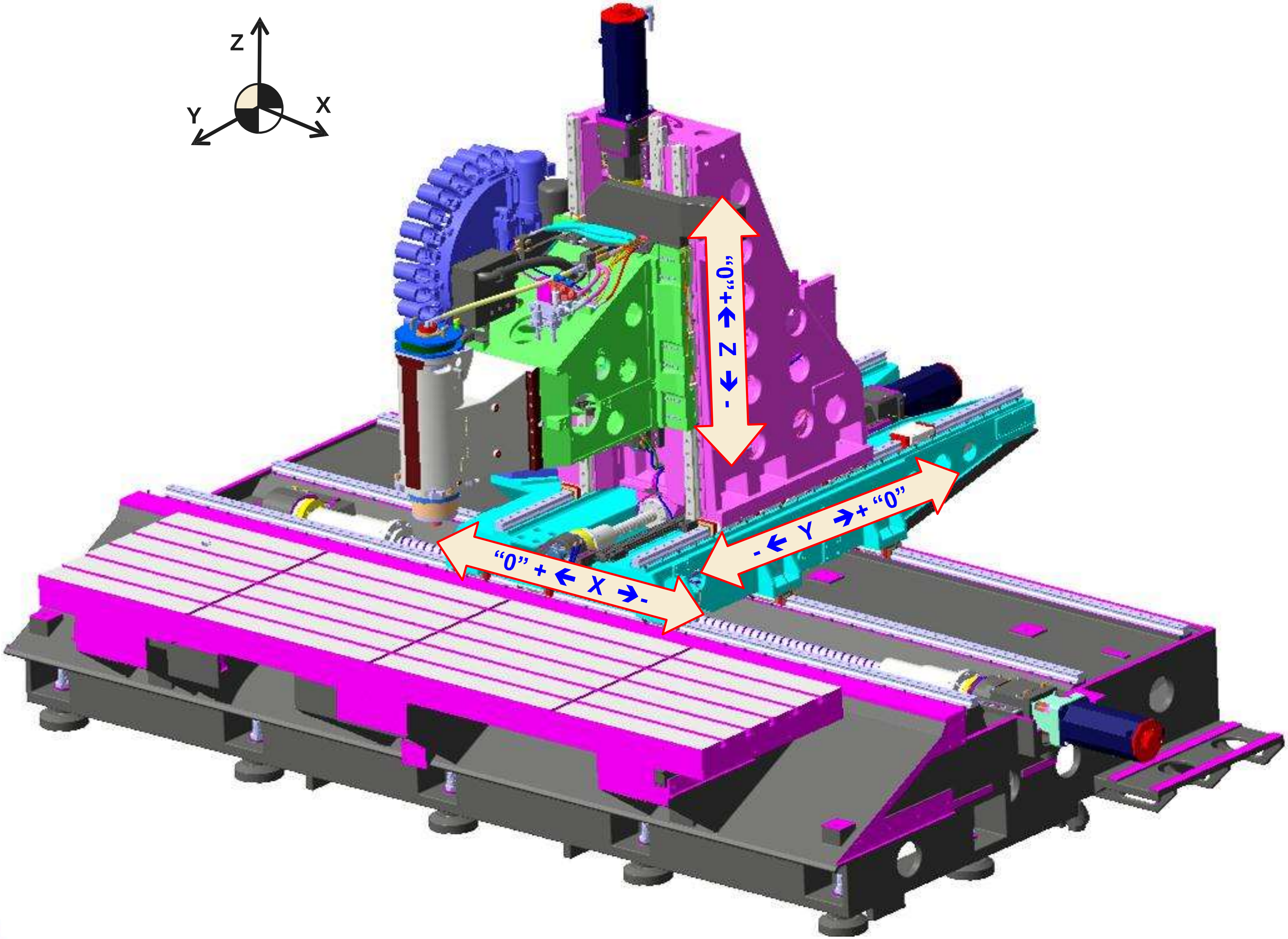


Access convenience structure
- 180˚ Swiveling Type OP Panel
- Easy operation & vision

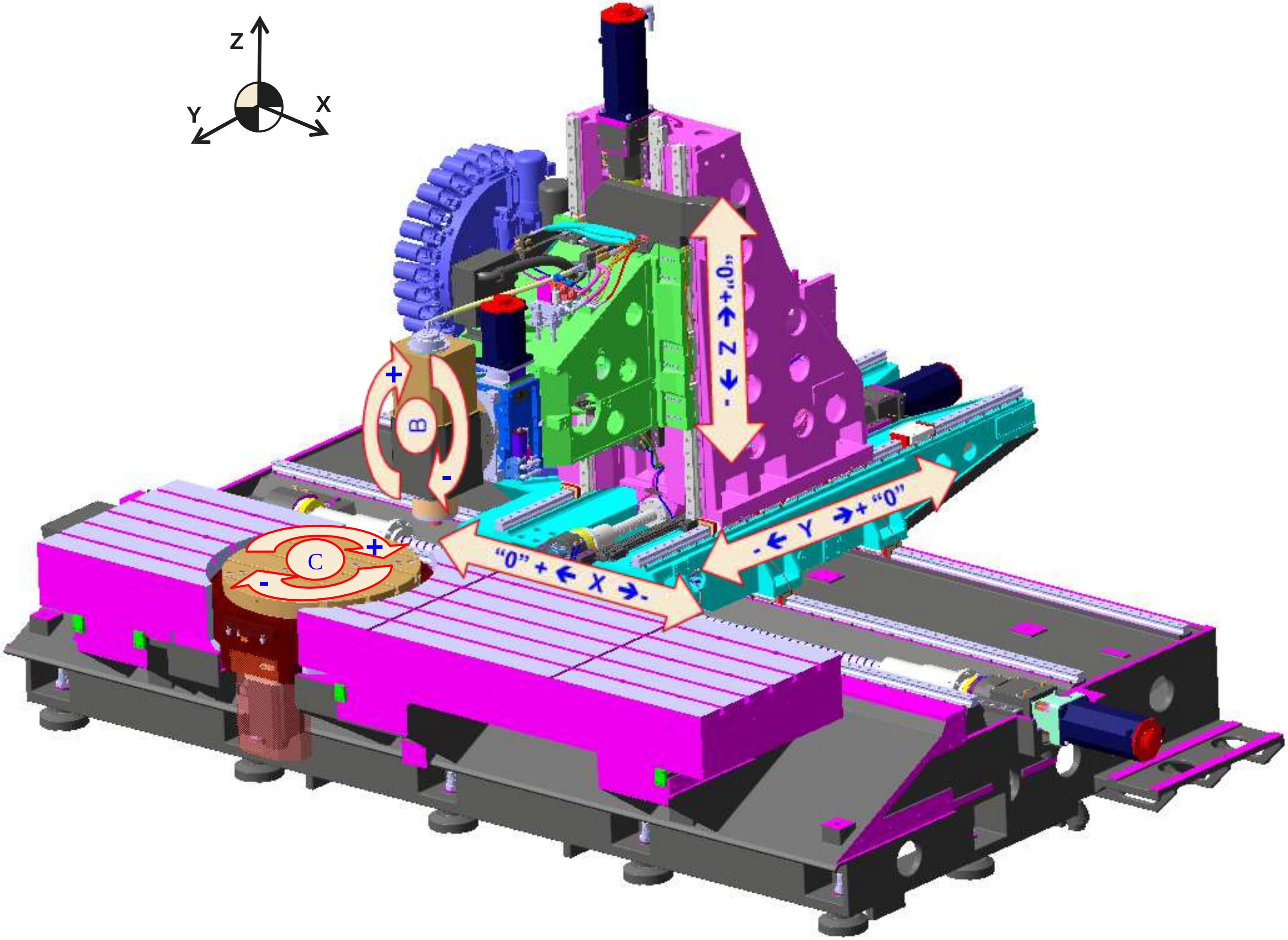
Z-AXIS
- Rapid traverse : 40mpm
- Roller type LMG
- Ball screw nut cooling
  & support bearing cooling (std.)
- Linear scale (Option)

Option
- Auto door
- Linear scale feed back system(X, Y, Z axis)
- Through the spindle coolant system
- Oil skimmer
- Oil mist collector
- Tool length & radius Measurement
- Test bar
- Chip conveyor & bucket
- MQL

[Back up] Structure (3 Axis)

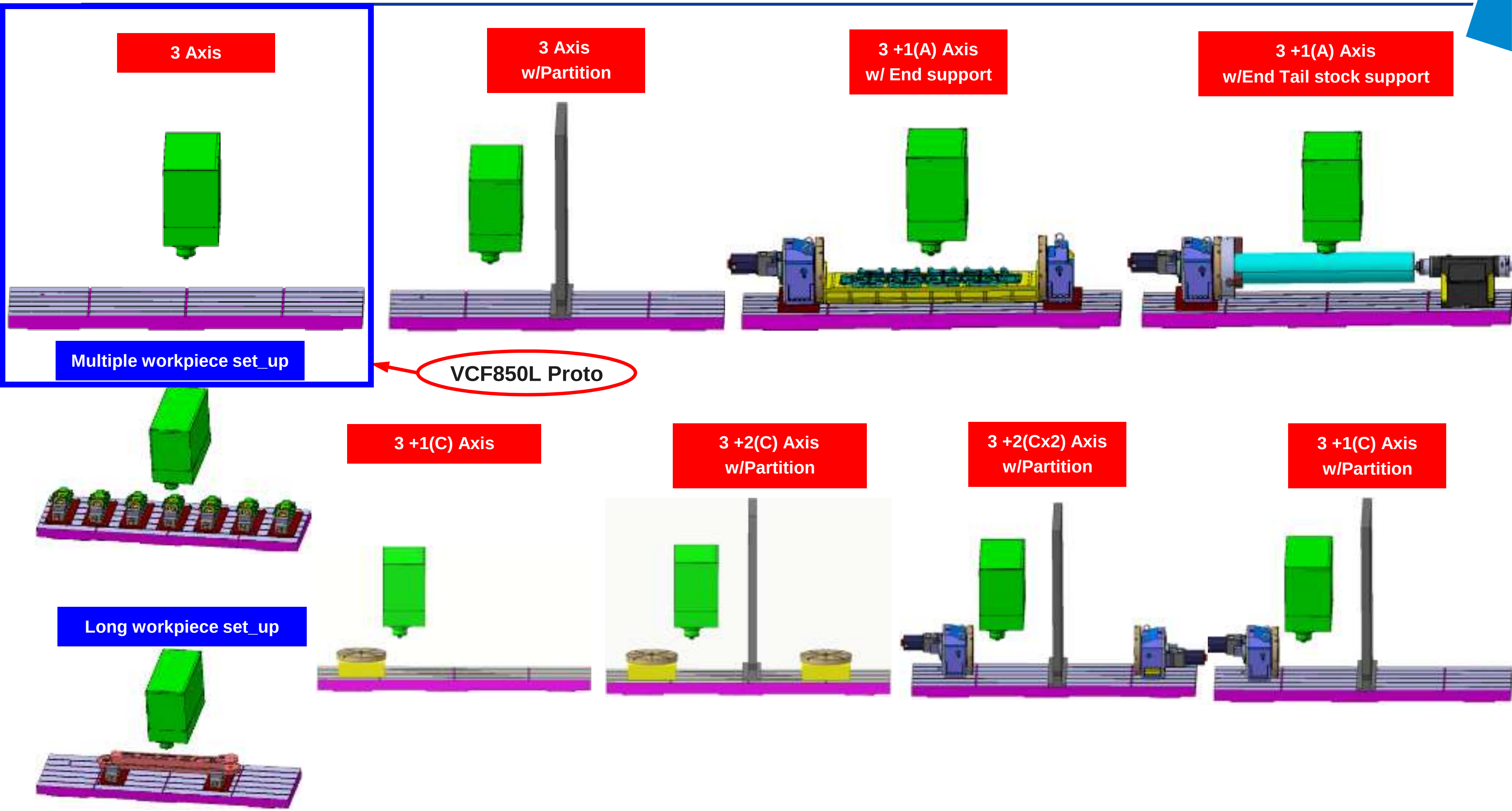


[Back up] Structure (5 Axis)



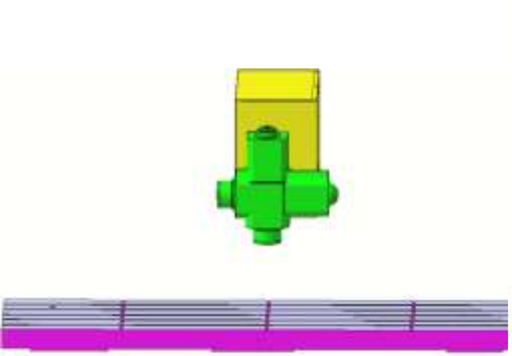
DOOSAN

[Back up] VCF850L Machine application(3 Axis)

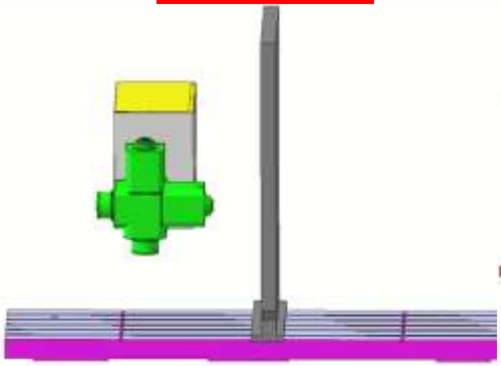


[Back up] VCF850L Machine application(w/Tilting head)

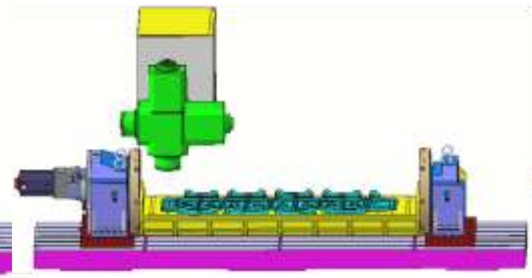
4(B) Axis



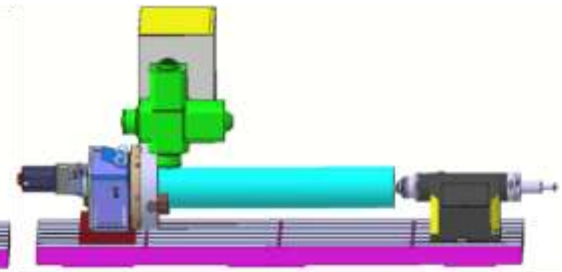
4(B) Axis w/Partition



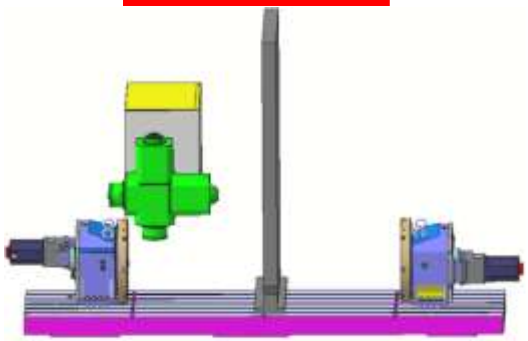
5(A&B) Axis w/ End support



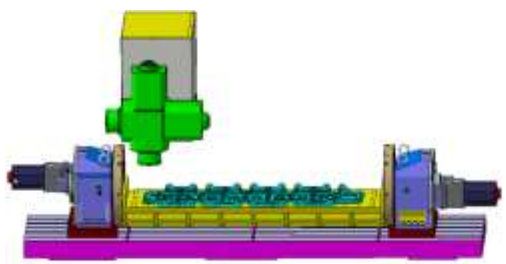
5(B&A) Axis w/End Tail stock support



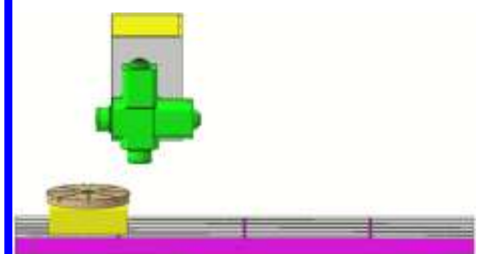
5(B&A) +1(A) Axis w/Partition



5(B&AX2) Axis



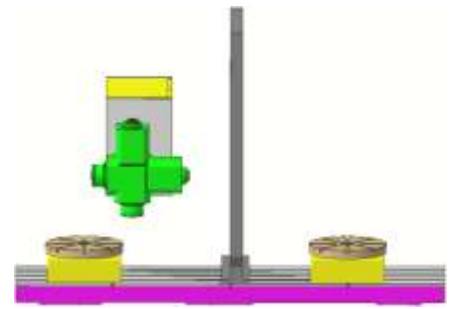
4(B) +1(C) Axis



Indexing Table(C axis)

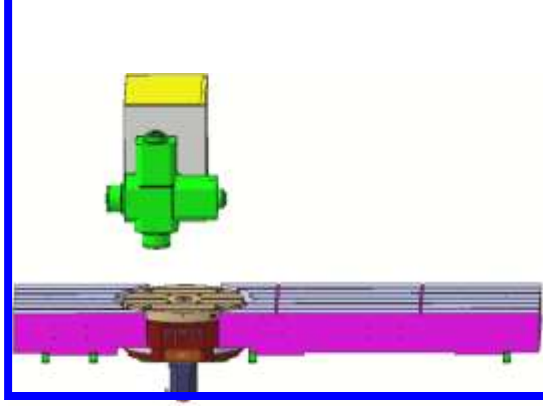
- Size / Rapid : **Φ500mm** / 20rpm
- Max. Allowable Load : 1,200kg
- Max. Workpeice
  : Φ730 x h 600
- Made in Doosan

4(B) +2(C) Axis w/Partition

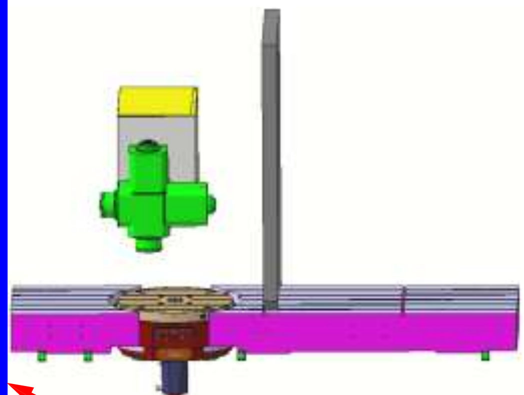


[Back up] VCF850L/5ax Machine application(w/Tilting head & Built in table)

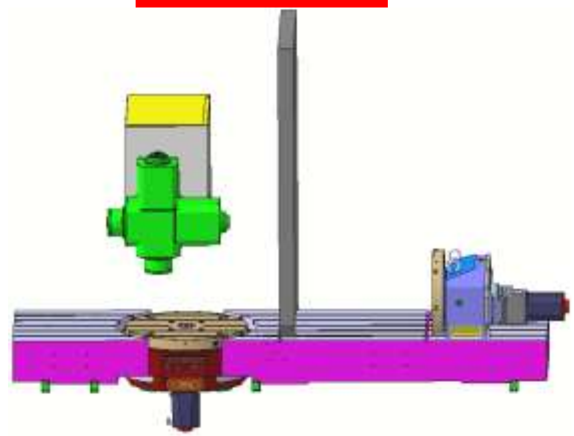
5(B&C) Axis



5(B&C) Axis w/Partition



5(B&C) +1(A) Axis w/Partition



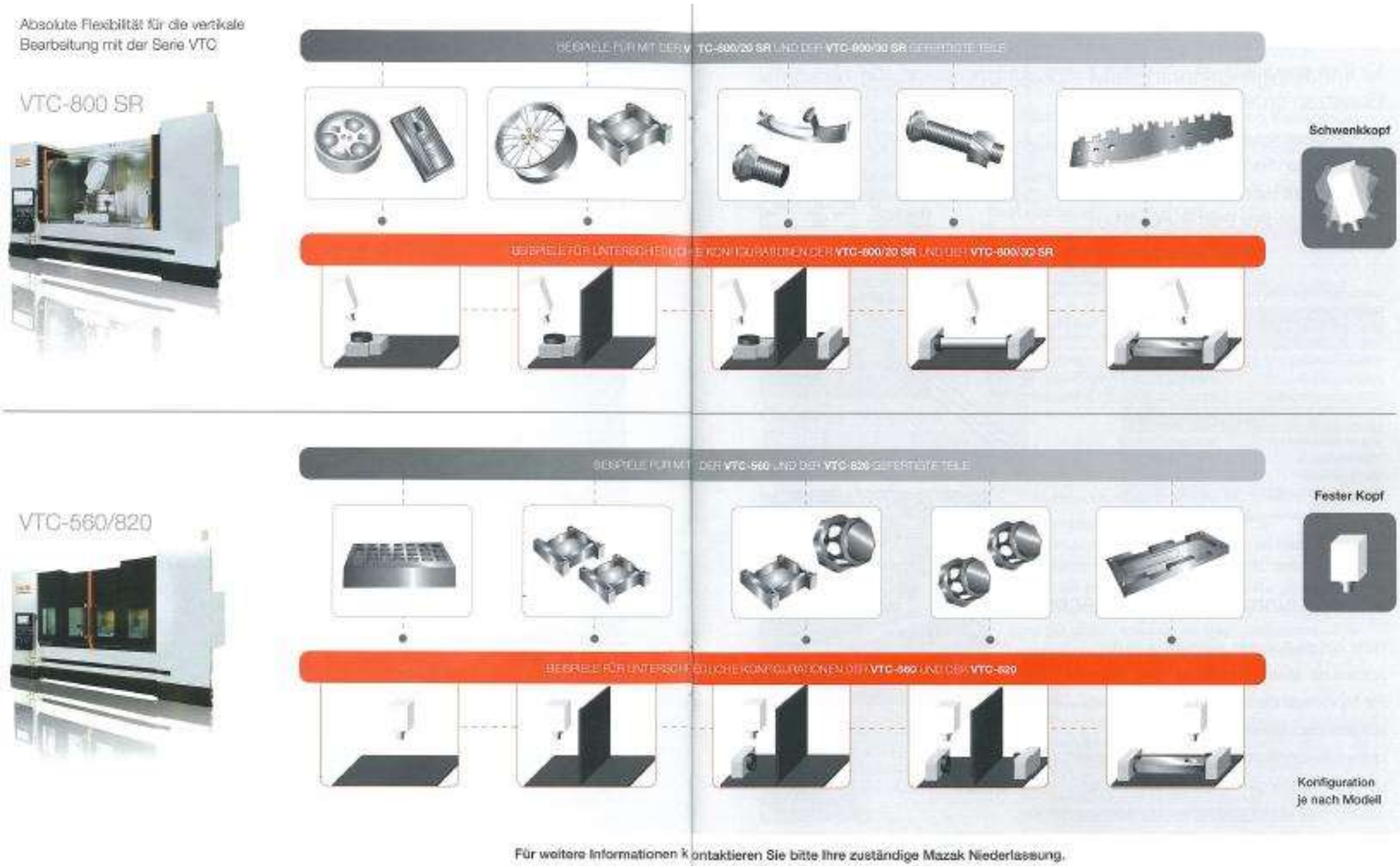
Indexing Table(C axis)

- Size / Rapid : **Φ800mm** / 25rpm
- Max. Allowable Load : 1,200kg
- Max. Workpeice
  : Φ1,050 x h 900
- Made in Doosan

VCF850L/5AX Proto(exhibit at `14.4 simtos)

Mazak VTC series (1/4)

Job-shop 고객의 다양한 수요산업의 중/대형 다품종 가공용



Mazak VTC series (2/4)

Column moving for X/Y axis, Partition for twin table, 별치형 NC Rotary table for 5axis(Hor./Ver.), Mazatrol

Schwankkopf (B-Achse)

Senkrecht (Drehachse)

Waagerecht (Drehachse)

MAZATROL matrix nexus   MAZATROL matrix

Mazak VTC series (3/4)

200C

テーブルサイズ	2300×510 mm
移動量 (X/Y/Z/B/C)*1	1950/510/510/-/- mm
早送り速度(X/Y/Z)	30000 mm/min
主軸回転速度(50%ED)	10000 min⁻¹(rpm), 15 kW (20 HP) (10分定格)
ツールシャンク	MAS BT-40
工具収納本数	24,*30
所要床面の大きさ	2925×3950 mm

800/30SR

テーブルサイズ	3500×820 mm
移動量 (X/Y/Z/B/C)*1	3000/800/720 mm/±110°/360°*1
早送り速度(X/Y/Z)	50000 mm/min
主軸回転速度(50%ED)	18000 min⁻¹(rpm), 35 kW (25 HP) (50%ED)
ツールシャンク	MAS BT-40, *CAT-40
工具収納本数	30,*48
所要床面の大きさ	5250×3550 mm

*オプション *1C軸(円テーブル含む)はオプション

2013년 최신
마작 전체 카달로그

Standard Machine Specifications				
		VTC-800/30SR		
Travel	X axis	mm	3000	
	Y axis	mm	800	
	Z axis	mm	720	
	B axis	Deg.	±110	
	C axis (option)	Deg.	360	
Table	Size	mm	3500x820	
	Load capacity	kg	2500	
Spindle	Spindle taper		ISO 40	
	Max. speed	min-1	18000	
	Power (50% ED)	kW	35	
	Torque	Nm	166	
Feed rate	Rapid traverse (X, Y, Z axis)	m/min	50	
Magazine	Number of tools		30	
	Max. diameter of tool	mm	80 (130*)	
	Max. length	mm	350	
	Max. weight	kg	8	* adjacent tool pockets empty

동일 기종명에
C축 옵션
(5축 베이스)

Standard Equipment	Optional Equipment	
Full coverage chip and coolant guard	C- axis rotary table	Workpiece airblast
Tool length measurement unit	Kitagawa MR320 rotary table	Oil mist filtration
Flood and through spindle coolant (5 bar)	Centre partition	Scale feedback system
Spindle chiller unit	Table riser (130	Renishaw OMP60 touch probe for work measurement
Work light	48 tool magazine	Synchronized tapping
Preparation for chip conveyor	Chip conveyor (hinge type)	Robot interface
Machine manuals	High pressure coolant system (15 bar)	Spin windows
Foundation kit	Mayfran Consep2000 II chip removal/coolant cleaning system (15 bar)	Additional work light
	Mayfran Consep2000 II chip removal/coolant cleaning system (70 bar)	Signal tower

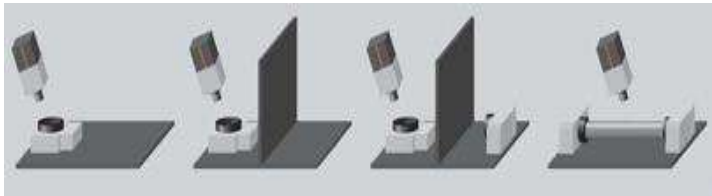
Center partition

Vertical machining center for 5-axis simultaneous machining

VTC-800/30 SR provides multiple-face milling and 5-axis simultaneous machining thanks to the 110 degree swinging 18000 rpm spindle and optional NC table. The traveling column design with stationary table is extremely effective for l

Optional NC table
➔ 별치형 R/table 표기

Mazak VTC series (4/4)



Swivel head(B축)

2 The swivel head offers a (+/-) 110 degree tilt axis and is equipped with the latest roller gear cam technology. This technology is also used on Mazak's Integrex range of multi-tasking machine tools, a feature that delivers improved accuracy and repeatability due to its backlash-free design.

A significant reduction of machining processes and increased productivity can be realized thanks to the additional axis, and when combined with a rotary table, full five-axis simultaneous machining is possible.

The 6th generation conversational CNC control from MAZAK. MAZATROL, the first conversationally programmed CNC system in the world, was introduced in 1981. In 1998, the MAZATROL was fused with a personal computer that incorporated our extensive expertise for unsurpassed operating efficiency...
The newest model, the MAZATROL MATRIX, has been designed to be the optimum system for machine tools, offering a range of Intelligent Functions for increased productivity and ease of operation.

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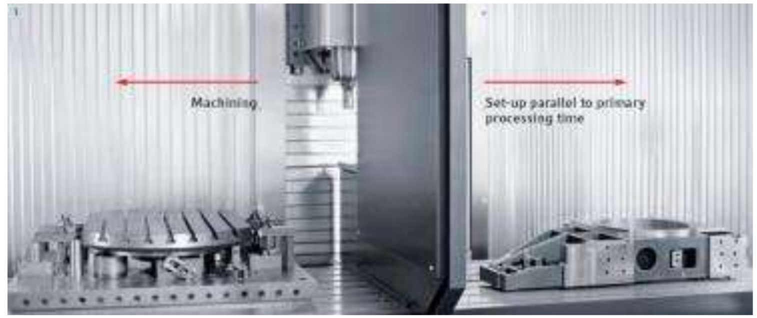
The newest model, the MAZATROL MATRIX NEXUS, has been designed to be the optimum system for machine tools, offering a range of Intelligent Functions for increased productivity and ease of operation for the entire NEXUS machine range as well as the new INTEGREX j series.

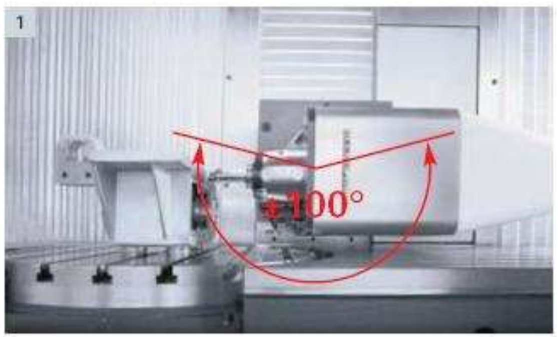
CNC CONTROLLERS

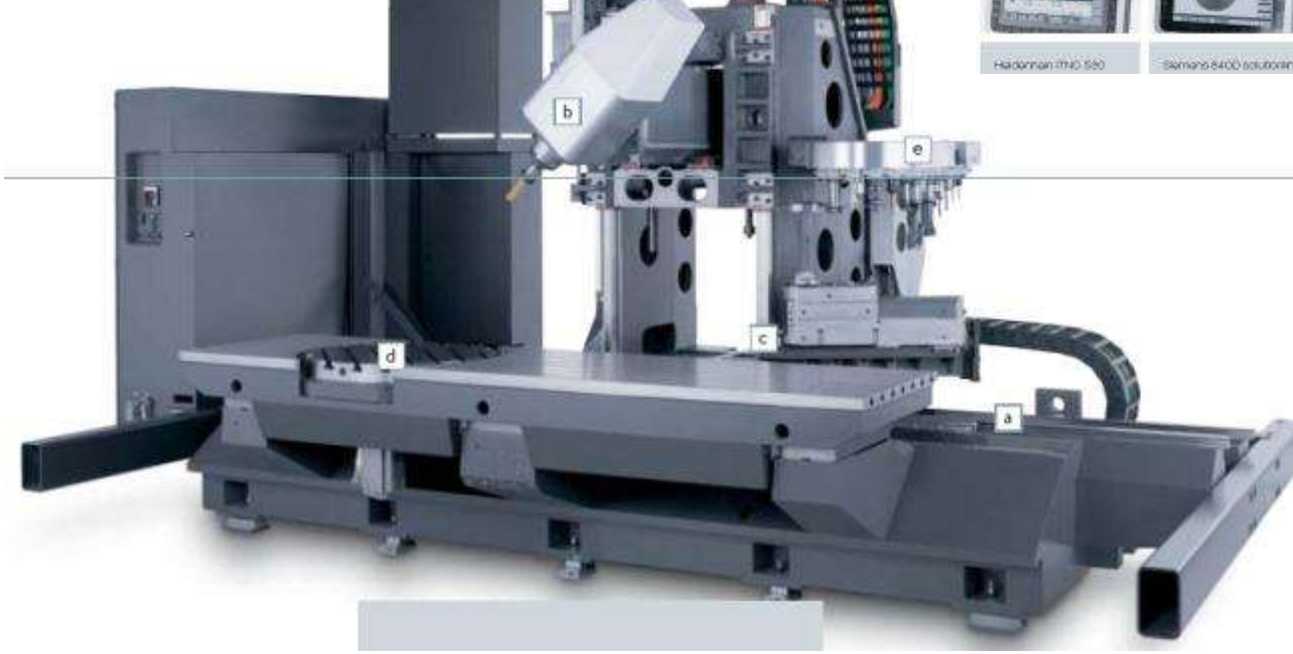
MATRIX	MATRIX NEXUS	SMART	FUSION 640
			
▶ Controlled Axes: 5 ▶ Mazatrol & EIA/ISO func. ▶ 4000 registered tools ▶ 15" Display ▶ Product Page	▶ Controlled Axes: 3 ▶ Mazatrol & EIA/ISO func. ▶ 4000 registered tools ▶ 12" Display ▶ Product Page	▶ Controlled Axes: 4 ▶ SMART functions ▶ EIA/ISO Comparability ▶ 10.4" Display ▶ Product Page	▶ Controlled Axes: 3 ▶ Mazatrol & EIA/ISO func. ▶ 960 registered tools ▶ 10.4" Display ▶ Product Page

DMF series (1/2)

Column moving for X axis, RAM Spindle head, Linear motor(옵션), Partition for twin table, Integrated NC Rotary table for 5axis, milling & turning, iTNC530/S840D







DMF series (2/2)

23/03/2012
Transport zone: ohne Zone / no zone defined

No. of axes: 4 controlled main axes (spindle, X,Y;Z-axis)
optional:
B-Axis (Swivel head)
C-axis (nc-subtable)
A-axis (nc-subtable, nc-divider)
3, 4 or 5 - axis interpolation according to specification
2 axis circular-interpolating, helix interpolation

Swivel head(B축)
NC-subtable(C축)

NC-subtable
(별치형, C축)

S-G3212
NC sub-table d 700 mm / d 27.3 in as C-axis mounted on the rigid table with absolute direct measuring system.
Installation in the left working area
No through bore in the center of the table is available.

Partition wall
(center partition)

S-G3205
Removable partition wall (possible with integrated round table)

The working area can divided by a removable partition wall. For security on Travelling column is a stop switched in by pneumatic support.

VC 5AXIS series

Function

Rotary table dia. (mm)	Tool taper	Non simultaneous 5AX((4+1axis)	Simultaneous 5AX	
		F0iMD	**F31i5**	**iTNC530**
350	#40		DNM 350/5AX	
	HSK E40			FM 350/5AX *linear*
500	#40		NX 500/5AX	
630	#40		**VC 630/5AX**	

Size

VC630/5AX – OVER VIEW

- Sim

MAJOR SPECIFICATION

- Stroke [X/Y/Z] : [650/765/520 mm]
- Stroke [A/C] : [+30˚ ~ -120˚ / 360˚]
- Spindle : 12,000 rpm, 18.5/22kW, BT40
- Table size : Φ630 mm (2-500 x 500mm)
- Max. Workpiece : Φ730x500 mm (Φ730x450 mm)
- Allowable load : 500kgf
- Rapid traverse[X/Y/Z],[A/C] : [40/40/36 m/min], [20/30 rpm]
- Tool change time : 1.5 sec [T-T-T]
- Tool storage capacity : 40 (60/81/101/121)EA

APPLICATION

- AUTOMOTIVE COMPONENT
- AEROSPACE
- ENERGY

TYPICAL WORKPIECE

- IMPELLER
- ENGINE BLOCK

OPTIONAL FEATURES

- BT / HSK, 12,000 / 20,000 / 30,000 rpm SPINDLE
- ATC : 40 (60/81/101/**121**)EA
- **APC : 2- PALLETS**

COMPETITOR

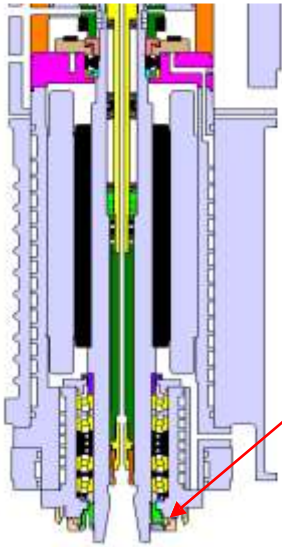
- MORI, MAZAK, DMG

STATUS / SCHDULE

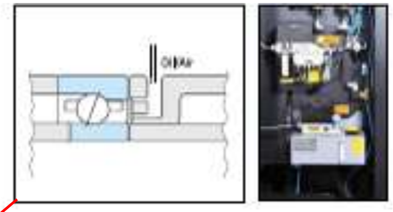
- Under Mass Production

VC630/5AX – Optional Spindle (20,000min^{-1})

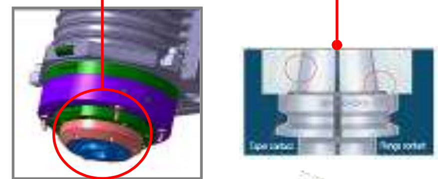
1) Built-in motor driven spindle



Air-oil Lubrication



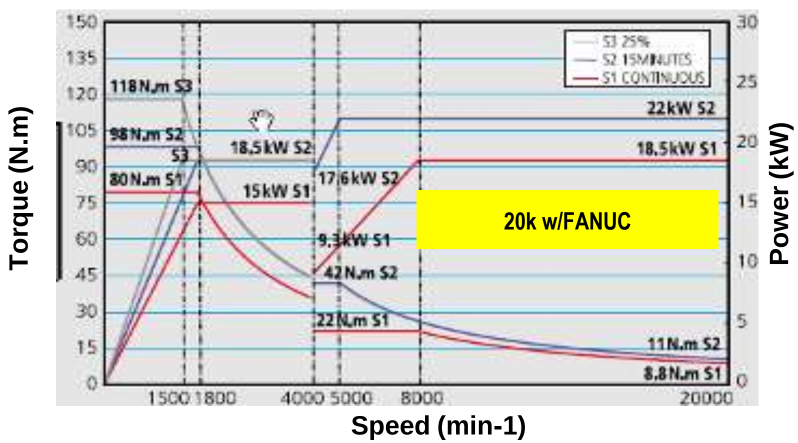
Dual Contact(BIG PLUS) Std.

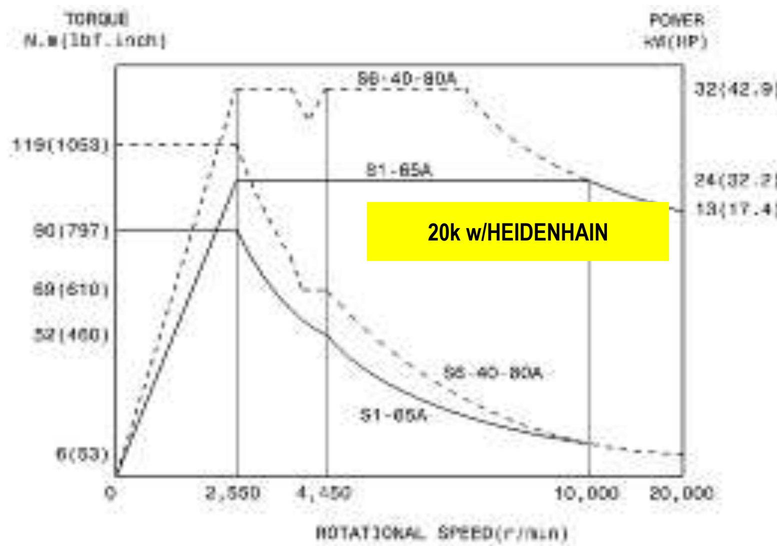


HSK Spindle Opt.

- HSK-A63 for 20k
- HSK-E50 for 30k

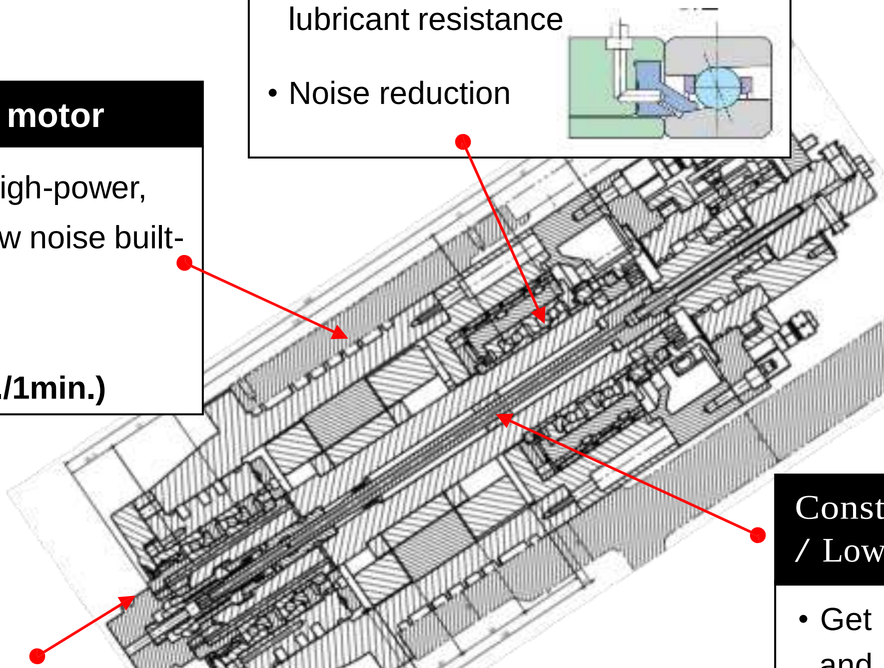
2) Spindle power-torque diagram





VC630/5AX – Optional Spindle (30,000min^{-1})

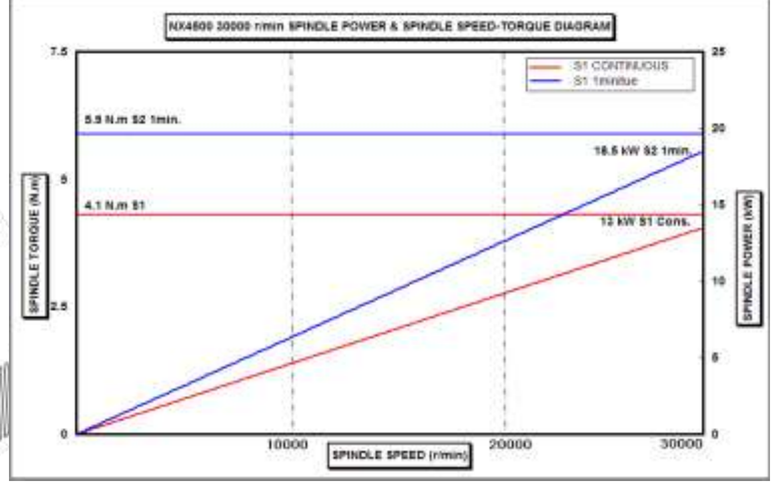
High-speed built-in motor spindle with constant preload mechanism



Adopt eco–friendly oil air

- Minimized power loss due to lubricant resistance
- Noise reduction

Motor torque / power diagram

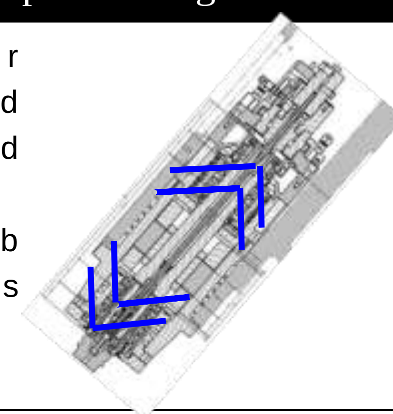


High-speed Built-in motor

- Adopt High-speed, High-power, Low vibration and Low noise built-in motor
  - –30,000 r/min
  - –13/18.5 kW (const./1min.)

Constant preloaded bearing / High stiffness / Low vibration/ Low noise spindle design

- Get longer life in high speed r and high rigidity in low speed r through adoption of fixed pre-l structure.
- Realize low noise and low vib spindle through reduction of s length.



Dual face contact HSK–F63 tooling system

- Improve rigidity from dual face contact (spindle nose and taper)
- Improve tool life and surface roughness through reduction of vibration

VC630/5AX - Specification

	Features		HEIDENHAIN	FANUC
Travel	X-axis (longitudinal movement of table)	mm (inch)	650 (25.6)	
	Y-axis (cross movement of saddle)	mm (inch)	765 (30.1)	
	Z-axis (vertical movement of spindle head)	mm (inch)	520 (20.5)	
	A-axis (table tilting)	deg.	150 [+30~ -120]	
	C-axis (table rotation)	deg.	360	
	Distance from spindle nose to table top	mm (inch)	210 ~ 730 (8.3 ~28.7)	
	Distance from spindle center to column guideway	mm (inch)	220 (8.7)	
Table	Table size	mm (inch)	ø 630 (ø 24.8) {**500 x 500**}	
	Table loading capacity	kg (lb)	500 (1102.3)	
	Max. workpiece swing diameter x height	mm (inch)	ø 730 x 500 (ø 28.7 x 19.7) {**Φ 730 x 450**}	
	Minimum table indexing angle		0.001	
Spindle	Max. spindle speed	r/min	12000	
	Spindle taper		ISO#40 7/24 Taper	
	Max. spindle torque	N·m (ft-lbs)	119 (87.8)	204 (150.6) [25% ED]
Feedrate	Rapid traverse rate (X/Y/Z)	m/min (ipm)	40 / 40 / 36 (1574.8 / 1574.8 / 1417.3)	
	Rapid traverse rate (A/C)	deg/min	20 / 30	
	Cutting feedrate (X/Y/Z)	mm/min (ipm)	20000 (787.4)	
	Cutting feedrate (A/C)	deg/min	7200	
Automatic tool changer	Type of tool shank		MAS403 BT40	
	Tool storage capacity		CAM 40	
	Max. tool diameter	mm (inch)	ø 80 (ø 3.2)	
	Max. tool diameter without adjacent tools	mm (inch)	ø 125 (ø 4.9)	
	Max. tool length	mm (inch)	300 (11.8)	
	Max. tool weight	kg (lb)	8 (17.6)	
	Method of tool selection		Fixed address	
	Tool change time (tool-to-tool)	s	1.5	
	Tool change time (chip-to-chip)	s	7	
Motor	Spindle motor (cont./10min)	kW (Hp)	24 / 32 (32.2 / 42.9)	18.5 / 22 (24.5 / 29.5)
	Feed motor (X/Y/Z/A/C)	kW (Hp)	7.2 / 4.6 / 4.6 / 7.2 / 5.7 (9.7 / 6.2 / 6.2 / 9.7 / 7.6)	7.0 / 4.0 / 4.0 / 5.5 / 4.5 (9.4 / 5.4 / 5.4 / 7.4 / 6.0)
Power source	Electric power supply	kVa	54	
	Compressed air supply	MPa (psi)	0.54 (78.3)	
Tank capacity	Coolant tank capacity	L (galon)	360 (95.1)	
	Lubrication tank capacity	L (galon)	1.32 (0.3)	
Machine size	Machine dimension (L x W x H)	mm (inch)	**Std. M/C :** 4585 x 3200 x 3295 (180.5 x 126.0 x 129.7)	
	Machine weight	kg (lb)	10000 (22045.9)	

{ } **APC Type**

Standard Feature

- AI Nano HPCC with RISC
- Assembly & operation tools
- Automatic power off
- Coolant tank & chip pan
- Door interlock for safety
- Flood coolant
- Full Enclosure splash guard
- Installation parts
- Operator call lamp (yellow, red, green)
- Portable MPG
- Screw conveyor
- Spindle air curtain
- Spindle cooling system
- Work light

Optional Feature

- Air blower
- Air dryer
- Automatic measuring system
- Automatic tool length measurement with sensor
- Chip conveyor & chip bucket
- MQL(minimum quantity lubrication) system
- Oil Mist collector
- Oil skimmer
- Spindle thermal compensation system
- Test bar
- Through the spindle coolant system
- Linear scale feed back system (X, Y, Z axis)

VC630/5AX – APC

APC
Front View

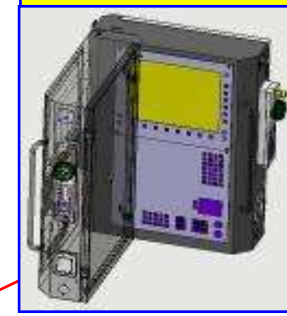
<VC630 5AX W/APC>

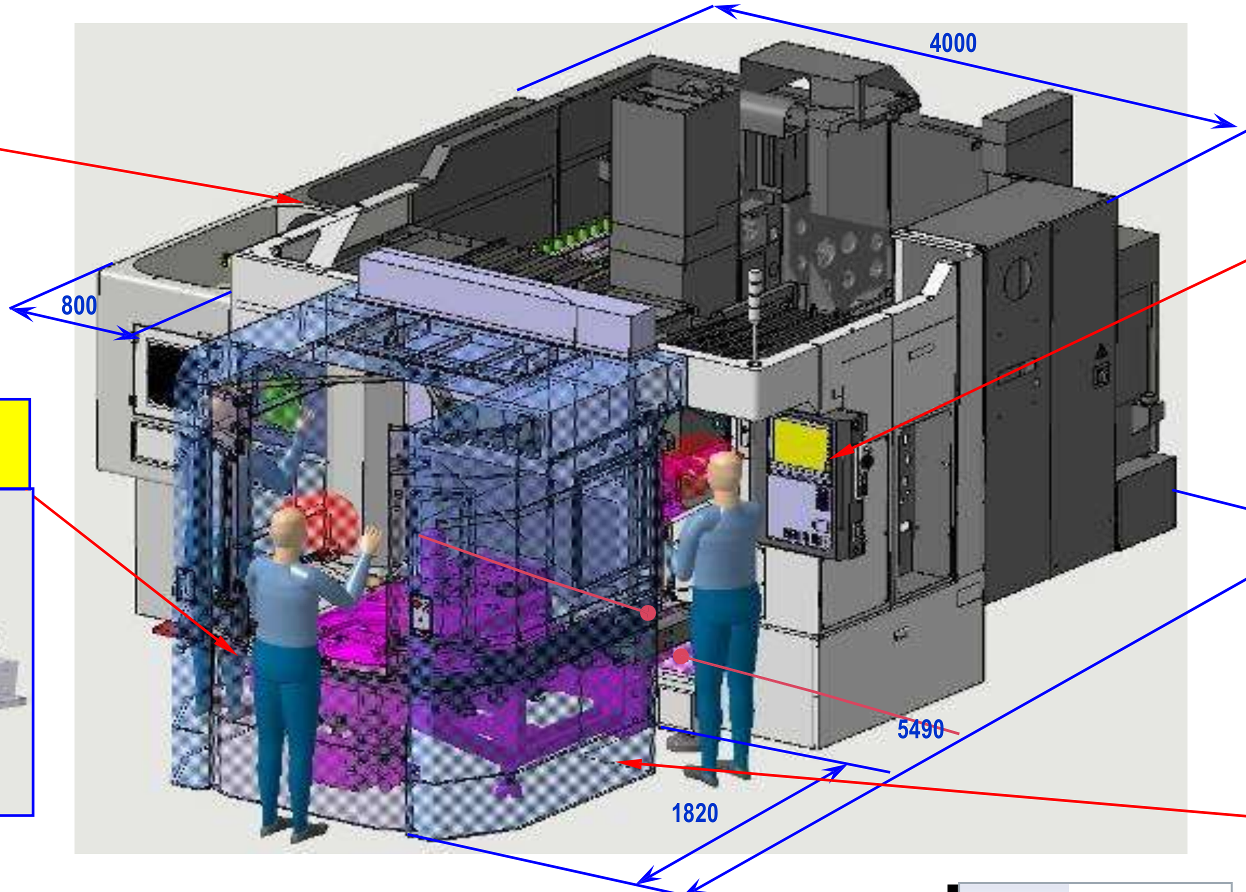
VC630/5AX – APC / 121 tools MAG.

81/101/121 MAG.

OP

90-degree rotation





Same APC drive

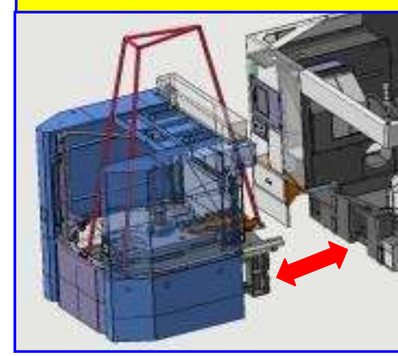
As NHM6300

Servo Driven
APC

Assembly

APC ASS`Y Separate

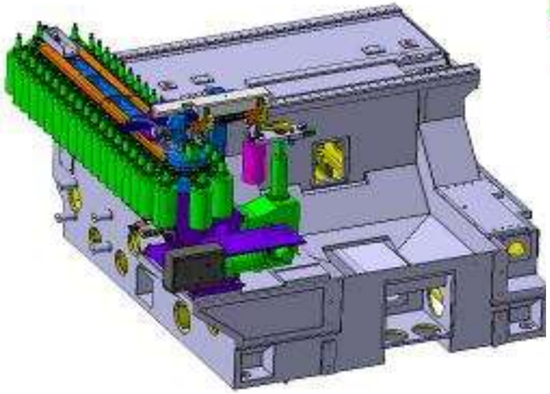
installation



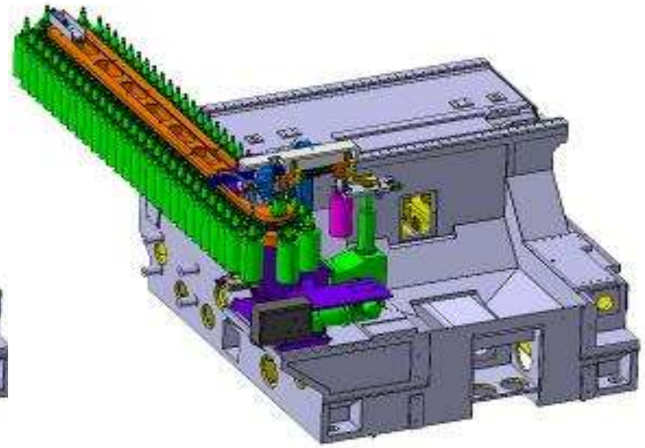
APC Time : 25sec

VC630/5AX – Various Tool Magazine

1) Configuration of ATC

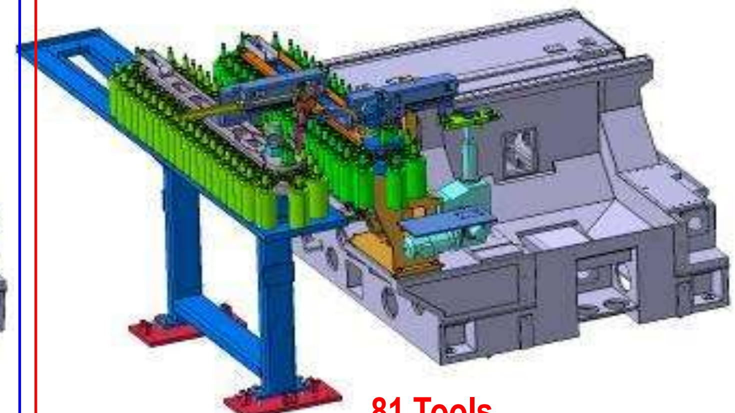


40 Tools



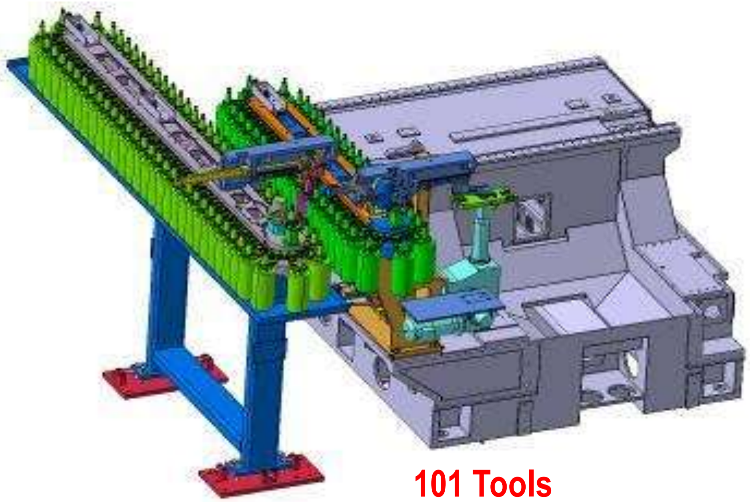
60 Tools

Development completed



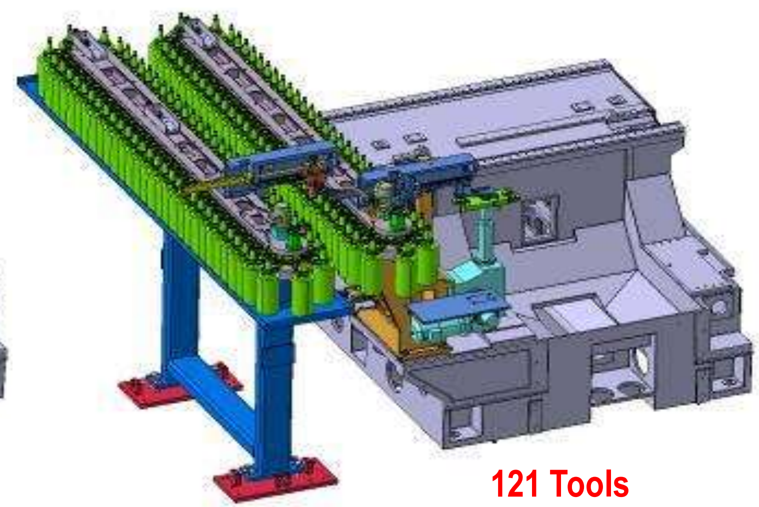
81 Tools

Development completed



101 Tools

Under Development



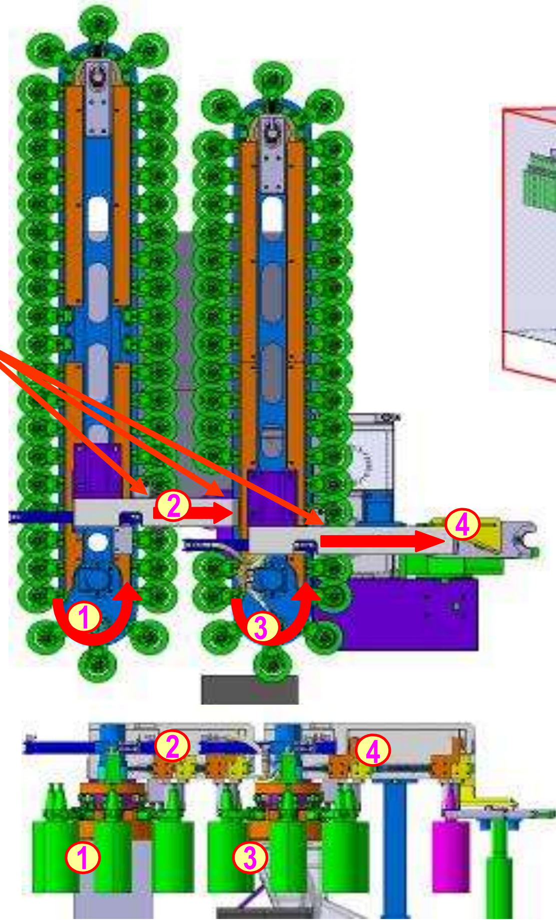
121 Tools

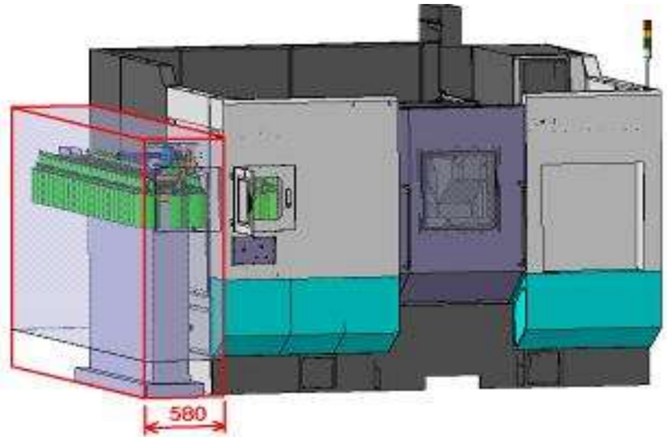
Under Development

VC630/5AX – Double Magazine

2) 81, 101, 121 Tools Magazine Concept

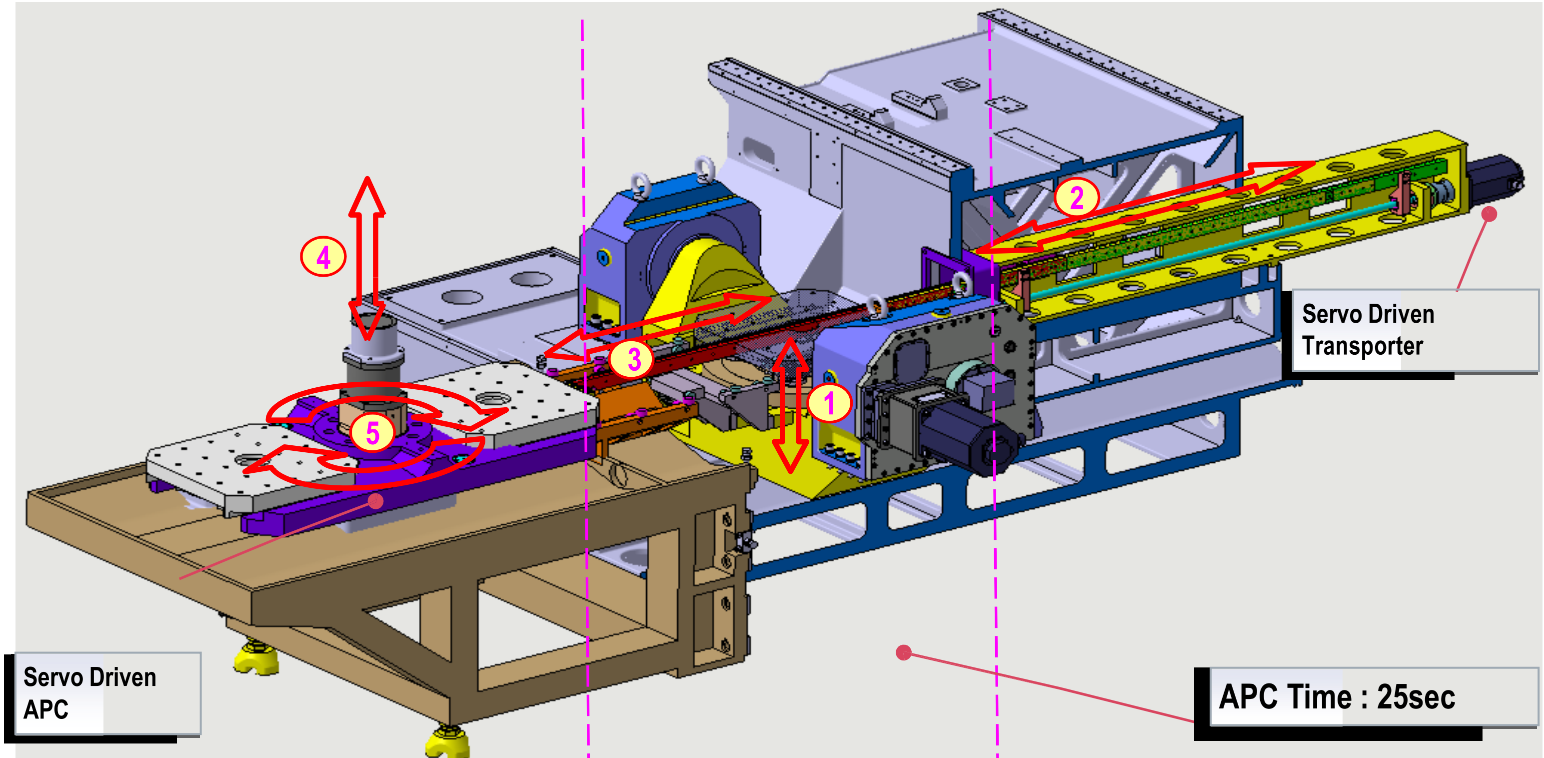
Tool detect sensor
: Anti-collision





VC630/5AX - APC

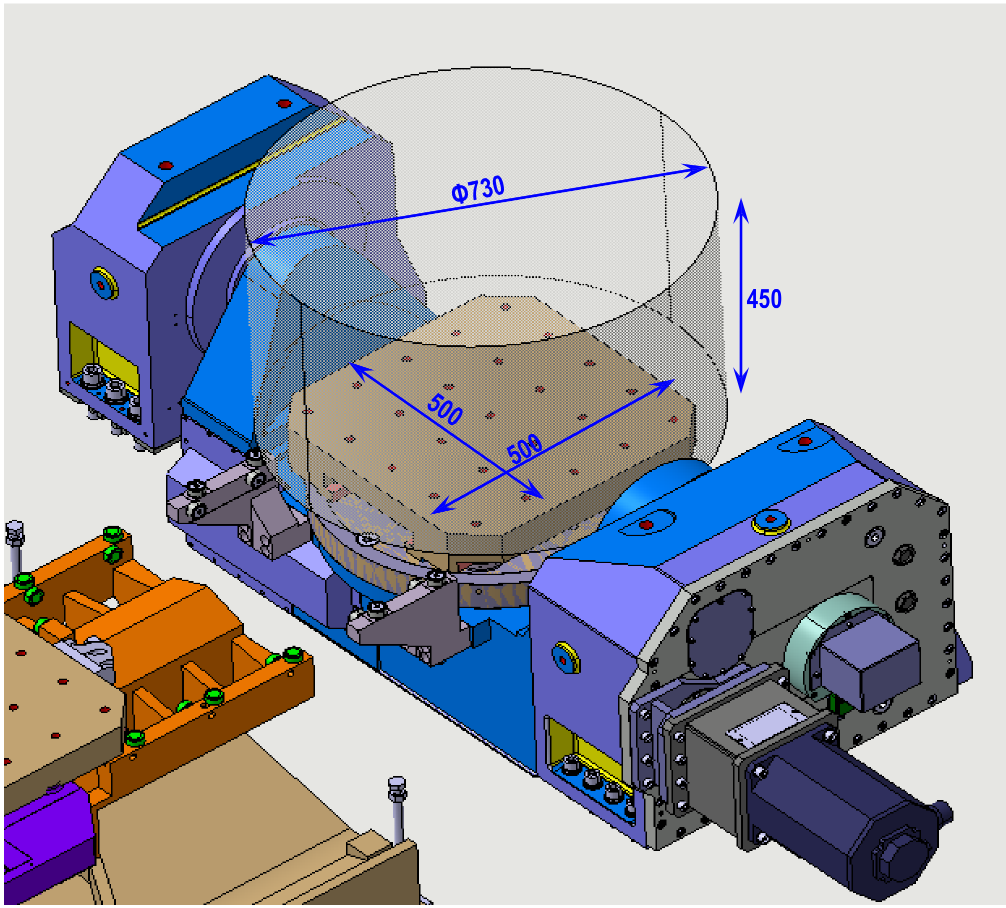
1) APC Concept



▣ Pallet Changer ▣ Rotary Table ▣ Pallet Transportation

VC630/5AX – Specification of Tilting & Rotary

ROTARY TABLE
W/APC



⊙ **SPECIFCATIONS**

<Standard>

TABLE SIZE	㎜	Φ630
STROKE(A / C)	˚ (deg)	+30˚~ -120˚/360˚
STROKE(A / C)	rpm	20 / 30
Indexing Accuracy (A / C)	sec.	10 / 10
MAX. WORKPIECE SIZE	㎜ (ΦDxH)	Φ730 x 500
MAX. WORKPIECE WEIGHT	kgf	500

<W/APC>

TABLE SIZE	㎜	500 X 500
STROKE(A / C)	˚ (deg)	+30˚~ -120˚/360˚
STROKE(A / C)	rpm	20 / 30
Indexing Accuracy (A / C)	sec.	10 / 10
MAX. WORKPIECE SIZE	㎜ (ΦDxH)	Φ730 x 450
MAX. WORKPIECE WEIGHT	kgf	500

Concept…

Doosan 5axis VMC

Compact class
C-frame
Direct coupled spindle

DNM 5AX series

DNM 200/5AX
DNM 350/5AX

* Direct coupled spindle from 2014 mass production plan

High precision
Column moving frame
Built-in spindle

VC 5AX series

VC 630/5AX
VCF 850 series

Ultra precision w/ Linear motor
Gantry type frame
Built-in spindle
Mineral cast iron

FM 5AX series

FM 200/5AX linear
FM 350/5AX linear

FM 5AXIS series

Function

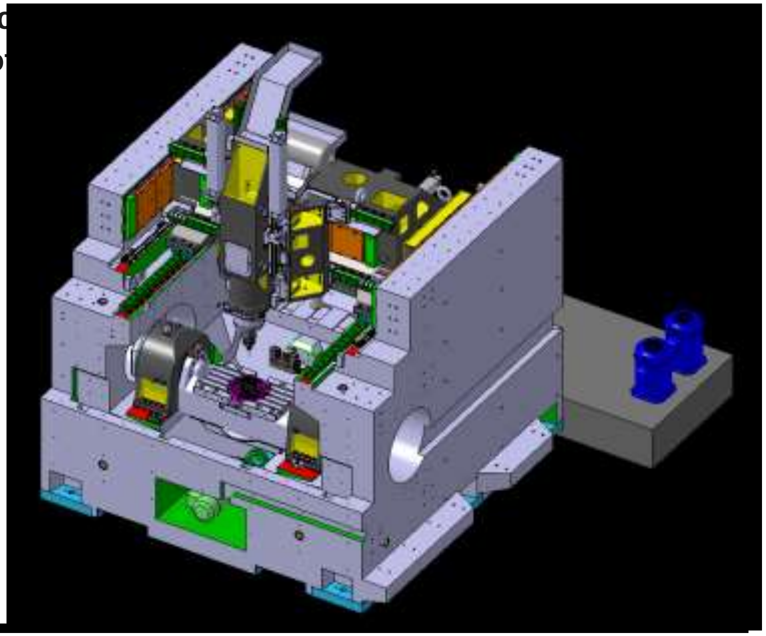
Rotary table dia. (mm)	Tool taper	Non simultaneous 5AX((4+1axis)	Simultaneous 5AX	
		F0iMD	F31i5	iTNC530
200	HSK E40			FM 200/5AX *linear* New
	#40	DNM 200/5AX		
350	#40	DNM 350/5AX	DNM 350/5AX	DNM 350/5AX
	HSK E40			FM 350/5AX *linear* New
500	#40			
630	#40		VC 630/5AX	

Size

FM350/5AX linear

Concept

- **High speed 5-axis machining center for small & complex die & mold parts**
- **Eac mo**



Launching / Mass production plan

- **Sales launching in May. 2013**

Exhibition plan

2014 : SIMTOS

Major specifications

• Stroke (X/Y/Z,A/C)	400/600/350mm/240/360deg
• Table size	Φ350
• Max. Load	100kg
• Spindle speed	45000 r/min(Built in)
• Rapid traverse	80/80/80 m/min /50/100 rpm
• ATC	HSK E 40 – 40Tools
• Controller	Heidenhain iTNC530

Sales points

- **Gantry structure for high speed and precision machining**
- **High speed axis system with linear motor & torque motor**
- **Mineral casting base for good vibration damping**

Target customers / Application

- **Precision die & mold for IT & Medical part**



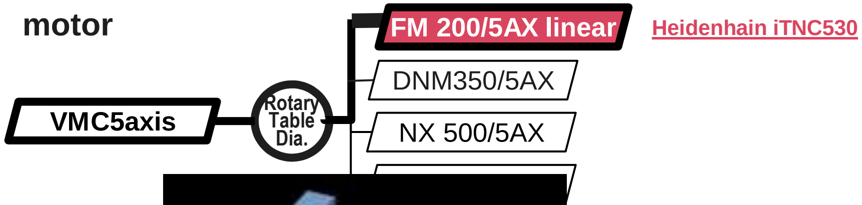
Competitors / Model

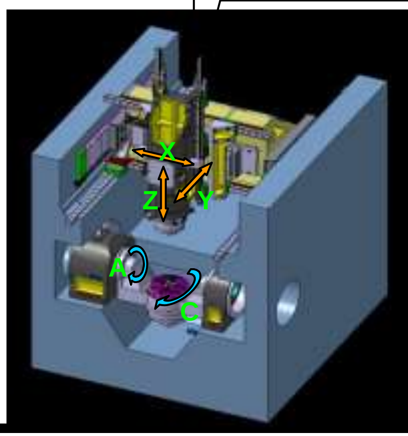
- **Makino, Mikron, Exeron**

FM200/5AX linear

Concept

- **High speed 5-axis machining ceter for small & complex precision parts**
- **Each axis is driven by linear motor / Direct drive motor**





Launching / Mass production plan

- Sales launching in Mar. 2014
- Mass production from Aug. 2014

Exhibition plan

2014 : SIMTOS

Major specifications

• Stroke (X/Y/Z/A/C)	200/340/300/-10~+130/360
• Table size	Ø 200
• Max. Load	15kg
• Spindle speed	45000 r/min(Built in)
• Rapid traverse	50/50/50 m/min /100/200 rpm
• ATC	HSK E 40 – 24Tools
• Controller	Heidenhain iTNC530

Sales points

- **Gantry structure for high speed and precision machining**
- **High speed axis system with linear motor & DD motor.**
- **Mineral casting base for good vibration damping**

Target customers / Application

- **Turbo charger Impeller, Medical parts and other precision parts**

Competitors / Model

- **DMG – HSC20 linear , Several Europeans**